THE

RAILWAY GAZETTE

Price: Two Shillings | FRIDAY, DECEMBER 20, 1957 | Annually £5 by post

ENGINEERING

JAN 13 1958

LIBRARY

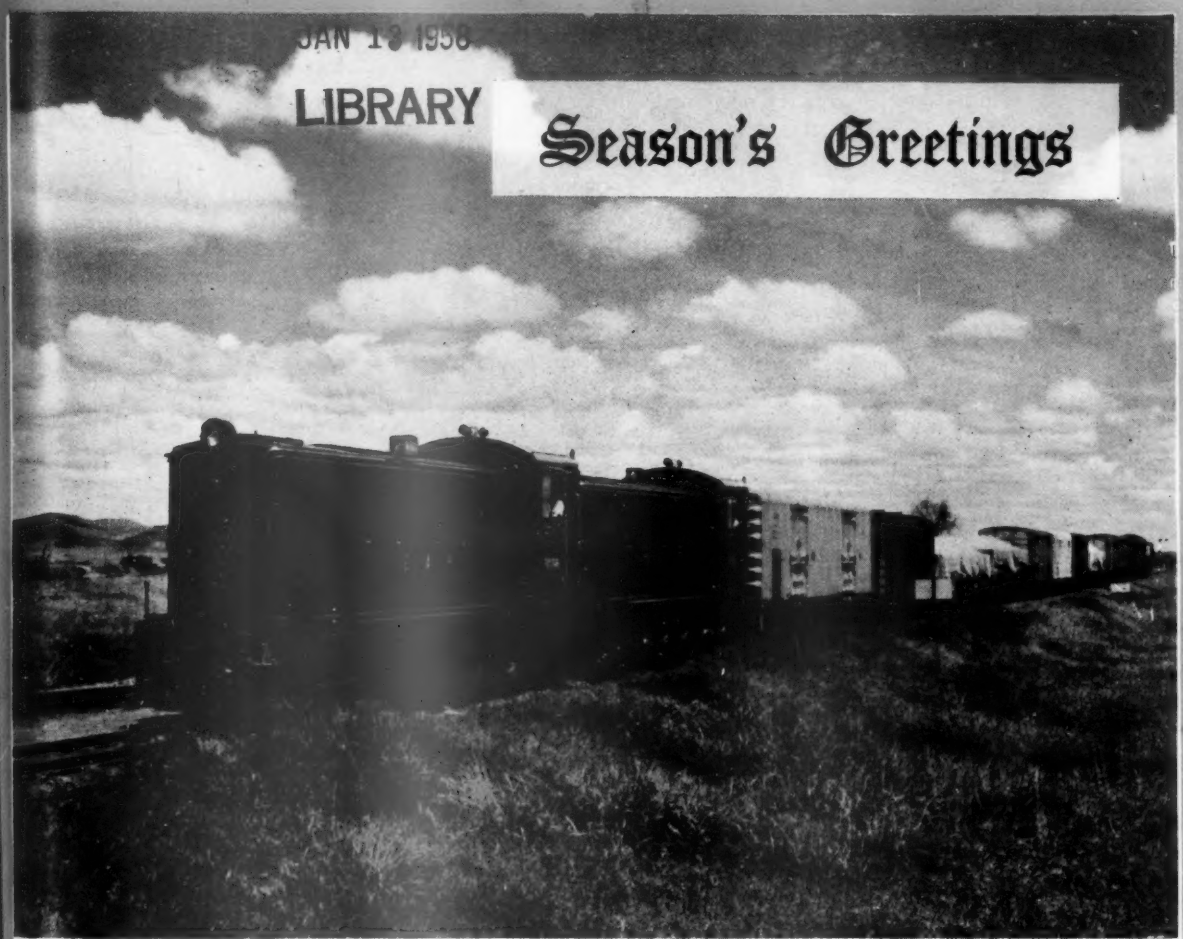


Photo by courtesy of East African Railways and Harbours

Two '85' Class E.A.R. & H. Diesel Hydraulic Locomotives built by North British Locomotive Company, with Voith-North British Hydraulic Transmissions and N.B.L./M.A.N. engines.

NORTH BRITISH

Locomotive Co. Ltd. Glasgow

This photograph taken at our Works, shows the assembly of the layout complete with timbers, set out to exact requirements for inspection. By courtesy of British Railways.

SWITCHES and CROSSINGS

BOW JUNCTION on the Liverpool Street - Shenfield Line of the Eastern Region of British Railways.

This layout was fitted with baseplates specially made to incorporate the Mills "C" type spring clip fastening and is the first of its kind to be used on British Railways.

We specialise in the manufacture of switches and crossings, single, double and outside slips, tandem, threethrow and simple turnouts, scissors crossovers and layouts of any description.

TAYLOR BROS. (SANDIACRE) LTD.

MIDLAND FOUNDRY, SANDIACRE, · NR. NOTTINGHAM

Telephone: SANDIACRE 3141 (5 lines) **(ESTABLISHED 1858)** *Telegrams: TAYLOR BROS. SANDIACRE*

LONDON OFFICE:
59, GORDON SQUARE, W.C.1.

Telephone: MUSEUM 2821 · Telegrams: TORRIDITY LONDON.

THE RAILWAY GAZETTE
A Journal of Management, Engineering and Operation
INCORPORATING
Railway Engineer · TRANSPORT · The Railway News
The Railway Times · Herapath's Railway Journal · RAILWAY RECORD.
RAILWAYS ILLUSTRATED · ESTABLISHED 1835 · Railway Official Gazette

33, TOTHILL STREET, WESTMINSTER, LONDON, S.W.1.
Telephone : WHitehall 9233 (20 lines) *Telegrams : "Trazette Parl, London"*
BRANCH OFFICES
GLASGOW: 139, Bothwell Street, C.2 . . . . . *Central 4646*
NEWCASTLE-ON-TYNE: 21, Mosley Street . . *Newcastle-on-Tyne 22239*
MANCHESTER: Century Insurance Building, St. Peter's Square *Central 3101*
BIRMINGHAM: 90, Hagley Road, Edgbaston . . . . *Edgbaston 2466*
LEEDS: 70, Albion Street . . . . . *Leeds 27174*
BRISTOL: 8, Upper Berkeley Place, Clifton . . . . *Bristol 21930*
Annually £5 by post. Single copies, Two shillings.
Registered at the G.P.O. as a newspaper. Entered as second-class matter in U.S.A.
Editor : B. W. C. Cooke, Assoc. Inst. T.

Vol. 107] FRIDAY, DECEMBER 20, 1957 [No. 25

CONTENTS

	PAGE
Editorial Notes	697
Public Accountability of Nationalised Industries	699
Freeman, Fox & Partners Centenary	700
Narrow Gauge Lines in South-West Africa	700
Applying U.S.A. Diesel Traction Experience	701
Ceylon Government Railway in 1956	702
Letters to the Editor	702
The Scrap Heap	703
Overseas Railway Affairs	704
The Work of the Railway Clearing House	705
Developments in Spherical Roller Bearing Axleboxes—2	707
Electric Traction Section	711
Apprentice Training School at St. Pancras	716
Personal	717
New Equipment and Processes	720
News Articles	722
Contracts and Tenders	726
Notes and News	726

Railway Pay Claim Rejected

THE rejection by the British Transport Commission of the claims made by the three railway trade unions for higher pay and shorter hours is not unexpected. As the Government has given warning that there will be no extra Treasury assistance to finance wage increases, the Commission could hardly have given any other answer. The National Union of Railwaymen is asking for a "substantial" increase in pay, but the Associated Society of Locomotive Engineers & Firemen has named a definite figure of 10 per cent. Both these unions have asked also for a reduction in the working week from 44 to 40 hr. The Transport Salaried Staffs' Association, after the Commission had refused, unless all three unions joined in, to continue with a proposal for periodical reviews of pay, put forward a claim of its own, emphasising that it did so with reluctance. The claim is limited to an increase in salaries which would maintain the purchasing power of its members. The cost of living has risen by only three points since the last general railway pay increase; the T.S.S.A. claim therefore may be considered more reasonable than that of the other unions. Nevertheless, the T.S.S.A., also, is anxious to reduce the working hours of its members. The Manpower Adviser to the Commission, Mr. W. P. Allen, is understood to have told the representatives of the unions that to concede the claims would jeopardise the stability and prospects of British Railways, hamper the modernisation plan, and, in the long run, would be against the best interests of the staff. In the light of this warning, he asked the unions to reconsider their claims. The rates of pay of British Railways staff have risen by some 12 per cent in two years, and the Commission evidently feels that the retail price index has not changed sufficiently to justify yet another wage increase. Mr. Allen denied that average earnings on the railways compare unfavourably with those in many other industries and made the telling point that British Railways are no longer finding it particularly hard to attract and keep labour, except in areas where all employers are faced with similar difficulties. The executive committees of the unions are now considering the Commission reply, and the N.U.R. already has decided to raise the matter at the next stage of the negotiating machinery, the Railway Staff National Council—a course likely to be taken also by the other two unions. There is time for the unions to deliberate on the matter and, it is to be hoped, see wisdom.

Honour for M. Armand

M. LOUIS ARMAND, the President of the S.N.C.F., whose investiture by the British Ambassador in Paris of an honorary K.B.E. was recorded recently, is an outstanding figure in the international transport world. Since this is nowhere more apparent than in Britain there can be no doubt that Sir Brian Robertson and Sir John Elliott, representing the British Transport Commission and the London Transport Executive respectively, must feel great satisfaction at an official recognition of M. Armand's many services to British transport. M. Armand has had an unusual career to date, for his activities have ranged over wide and differing fields. A brilliant graduate of the Ecoles Polytechnique and Mines, his early years were passed as an engineer in the Service des Mines. He became interested in the problems connected with mineral springs and gained awards from the Académie de Médicine for his several published papers on this subject. During the last war he made patriotic use of the wide knowledge of railway organisation and working he had gained since embarking on a transport career in 1934; he served in several intelligence organisations and in particular as Group Leader of the "Resistance-Fer." He was arrested by the Gestapo and imprisoned at Fresnes, where he remained until freed in 1944 as a result of the Nording agreements. In the interests of the S.N.C.F. he has devoted himself to a number of technical problems. He has devised a method of locomotive water treatment, played a leading part in the research resulting in the use for electric traction of 25,000 V. industrial frequency current at 50 cycles, and implemented the postwar railway productivity policy of the S.N.C.F. which has enabled the system to move more traffic with considerably less equipment.

The Late Mr. E. Rawdon Smith

THE death of Mr. E. Rawdon Smith, O.B.E., at one time Public Relations Officer for the L.P.T.B., recorded elsewhere in this issue, removes a well-known and unusual figure from the transport scene. The individual is rare who can change his boats successfully in mid-stream: Mr. Rawdon Smith possessed this capability to an unusual degree. Beginning his career as a lawyer, his first contact with the then infant profession of public relations was made in the armed forces during the 1914-18 war when he joined the Recruiting Department of the War Office. His legal training and exceptional administrative qualities helped him in his postwar appointment as Secretary of the George Spencer Moulton group and, later, in his supervision of the affairs of A.E.C. (Australia) Proprietary Limited. It was not until 1928 that he directly entered the transport sphere as Assistant Secretary of the Underground Electric Railways group but even this change of occupation was not to be the last. In 1939 at

the age of 48, he went to Imperial Airways as Public Relations Officer, the same capacity in which he last served the L.P.T.B. During the last war, government recognition of his ability was demonstrated when he was seconded to the Dominions Office for public relations duties.

New Offices for Traffic Management Staffs

TWO "line" traffic headquarters in the Eastern Region of British Railways are housed in completely new office buildings. Mr. J. W. Dedman, Line Traffic Manager (London Tilbury & Southend), whose organisation started to function a year ago, has his headquarters at Saracens Head House, Fenchurch Street, near the passenger terminus of his line. We were able last week to see something of Great Northern House, the headquarters of Mr. G. F. Fiennes, Line Traffic Manager (Great Northern), who assumed his duties last month. The building, near Kings Cross Station, is not complete. It was possible, however, to see how a structure of pleasing design has been equipped with, apparently, everything conducive to the efficiency and comfort of those who work there. The Euston Road frontage moreover and the pleasant rooms to be entered by business callers are excellent publicity for British Railways. The inevitably outmoded appointments of many existing railway offices in this country have a depressing effect on their occupants and create a bad impression on the public. In that respect new structures are sound policy.

Overseas Railway Traffics

OPERATING revenues of the Canadian National Railways for October amounted to $61,962,000. Expenses, taxes, and rents totalled $62,147,000, resulting in a net operating income deficiency for the month of $185,000. In October, 1956, operating revenues were $70,931,000; expenses, taxes, and rents were $61,870,000 and net operating income was $9,057,000. The aggregate net operating income to October 31, was $3,281,000, compared with $44,180,000 for the corresponding period of 1956, a decrease of $40,899,000. Canadian Pacific Railway revenues for the same month were $41,324,164 (against $44,399,416 for October, 1956) and railway expenses $36,515,977 ($39,373,144) so that net earnings were $4,808,187 ($5,026,272). Aggregate net earnings from January 1, were $29,466,233 ($33,027,484). Salvador Railway Company receipts for September were colones 160,000, compared with colones 111,000 in 1956.

Locomotive Engineers' Dinner

THE second dinner and dance of the Institution of Locomotive Engineers was held at the Dorchester Hotel, London, on December 11. As last year, it was a highly successful occasion; some 410 members, their ladies and guests were present. The guests were welcomed by the President of the Institution, Mr. E. S. Cox. Past-Presidents who attended included Messrs. W. A. Agnew and J. S. Tritton, Lt.-Colonel H. Rudgard, Messrs. W. Cyril Williams, C. M. Cock, R. C. Bond, A. Campbell, K. J. Cook; and last year's President, Mr. J. F. B. Vidal, during whose term of office the event was inaugurated. The occasions are an excellent opportunity for members of the Institution and their friends to get to know each other better. To judge by the increased number of those who attended, about 50 more than last year, it would seem that this will become a regular, and popular, function.

New Zealand Traffic Developments

THE New Zealand Government has stated that no new railway construction is planned in the near future, but that efforts are being directed to more economical operation of existing lines of the Government Railways and improvement of their carrying capacity. Conversion to diesel traction is proceeding apace. Thus 30 diesel locomotives were added in 1956-57, while 76 steam locomotives were withdrawn. Many freight trains are now diesel hauled. Eighteen 400-h.p. diesel-electric shunters have been ordered from British Thomson-Houston Co. Ltd. Except for a few long-distance expresses, steam passenger trains are being progressively replaced by diesel railcars, of which 33, built in the United Kingdom, are now in service. To cater for growing freight traffic, many wagons are being built in New Zealand, but 2,300 wagons and 100 refrigerated bodies and underframes are on order from the Metropolitan-Cammell Carriage & Wagon Co. Ltd. More diesel locomotives, railcars, and wagons will be required and further orders for British-built locomotives and rolling stock may well be expected.

Higher Demurrage Charges

THE raising of British Railways demurrage charges from January 6 next, as reported on page 694 of our issue of December 13, will still leave these charges as the lowest, it is believed, made by any major railway administration in the world. It is also a reminder that demurrage charges are intended to be a penalty for the detention of the wagons, the proper purpose of which is to carry freight, not to act as temporary warehouses. Many people, even railwaymen, seem to regard demurrage as a hiring charge. Traders are often quite happy to pay this, as it saves their having to provide storage accommodation which would only be used occasionally. The fact that traders are willing to meet the charges suggests that they could be raised even further. The object should be to make it to the advantage of a trader to unload a wagon with the same celerity that he shows towards a road vehicle and its driver. The idea of treating demurrage as a source of revenue is admissible only if there is a considerable surplus of wagons—and careful management will be alert to see that surpluses of wagons are only temporary.

Automatic Train Control

MANY questions have been asked about automatic train control since the accident in the Southern Region at St. Johns on December 4. In the British Broadcasting Corporation television programme, "Panorama," Mr. Richard Dimbleby last week put the sort of questions the public has been asking to Mr. Cecil J. Allen, the well-known writer on railway matters. In the bustle of a television programme running, apparently, late and the inevitable half-finished statements of an interview, the impression was created that automatic control of the Great Western Railway type will not bring a train to a halt. That is not so. One of the features of that system is that when a distant signal is passed at caution a siren sounds and a gradual automatic brake application is initiated. This will bring a train to a halt, the actual distance taken depending on the speed and weight of the train, the gradient, and the number of vehicles fitted with automatic brakes. The driver can, however, cancel the warning and hence the brake application, when, having heard it, he quite correctly takes the control of the running into his own hands. In this sense, it is true that in normal circumstances the apparatus does not bring the train to a halt. There have been a few cases where the driver has failed to act correctly thereafter, such as the Milton (Didcot) derailment on November 20, 1955. The British Transport Commission has announced that it will do all it can to accelerate the extension of automatic train control to all main lines.

Using Low-Grade Diesel Fuel

SOME promising experiments made recently in the U.S.A. have shown that by introducing part of a low-grade diesel fuel into the cylinders of the engine as a fine mist through the air inlet manifolds, it may be possible to cut fuel costs by 10 per cent. The Pennsylvania Railroad tests have proved that "fumigation," as it is called, can increase power output by up to 18·5 per cent, or decrease fuel consumption by up to 9·8 per cent; and that it can effect anything up to 80 per cent reduction in

smoke. It has been found that a diesel engine can operate satisfactorily with sub-standard fuels even down to a zero cetane number when fumigation was in use. The maximum benefits were obtained when the fuel was injected in the form of a very fine mist; but as yet no economical apparatus has been devised for producing this finely atomised spray in sufficiently large quantities. An appreciably improved performance was obtained, however, by use of inexpensive pneumatic spray nozzles operated by a small amount of low-pressure air. The main advantage of fumigation is that it helps to obviate incomplete mixing of air and fuel, and also late combustion caused by long ignition lag. High-speed diesel engines, moreover, have difficulty in burning diesel fuels of 35 cetane number when on light load or idling, but fumigation of part of the main fuel at light loads should allow satisfactory operation at all loads.

Posthumous George Cross for Driver

A SUMMARY is published elsewhere in this issue of Brigadier C. A. Langley's report on the accident at Chapel-en-le-Frith South on February 9, 1957. The driver of the freight train which got out of control remained on the footplate in the most distressing conditions in a devoted endeavour to regain it and lost his life in the collision. He was posthumously awarded the George Cross. A total and very unusual failure of a pipe joint, the escape from which drove the enginemen back from their controls, rendered the steam brake useless. The fireman, on instructions, jumped off and strove unsuccessfully to pin down some wagon brakes. All others concerned acted with promptitude and did all they could, moving the passengers in a diesel train standing in the station to a place of safety. It was very unfortunate that the deterioration of the joint had failed to be realised and that a fitter, on the morning of the accident, was misled by what the driver said to him and so missed finding the root of the trouble.

Public Accountability of Nationalised Industries

THE first report of the Select Committee on Nationalised Industries should allay the fears of those who opposed its establishment on the grounds that it would be used for political purposes. Equally, the doubts of those who feared it might inhibit the boards of those industries and cause excessive looking over the shoulder, should be laid to rest. The Committee, under its chairman, Sir Patrick Spens, embarked on its task with commendable caution. Before dealing with any of the reports of the nationalised industries it set out to ascertain the exact relations between Government and boards in general and with the Treasury in particular. New light is thrown on this difficult problem of control and accountability of public corporations and the evidence given by the civil servants is more illuminating than anything previously available.

Two conclusions emerge. The first is that the Treasury's main concern is with the capital investment programmes of the boards and that, while it exercises considerable influence thereon, in so doing it does not unduly hamper the initiative of the boards. The second conclusion is that the Minister cannot give a directive which conflicts with the statutory requirements of the boards, namely that the industries must pay their way. That may be correct in theory; but although no directives were given in 1956 to the Scottish boards examined by the committee, the report makes it clear that it was in response to a Government request that tariffs were held down—which was contrary to their financial interest. This "voluntary" restraint was claimed for the British Transport Commission when it refrained from following through its intention of raising fares in the early Spring of 1956 and was prevented by the Minister of Transport & Civil Aviation, Mr. Harold Watkinson, from carrying out the recommendation of the Transport Tribunal; this was that the Commission should raise railway charges to the full extent sought, but the Commission was restricted by the Minister to increases of half that amount. At the time some people questioned not only the Minister's wisdom, but also whether he was in his rights constitutionally; this latter point was in doubt inasmuch as his action made fulfilment of the Commission's statutory obligation to pay its way, "taking one year with another," even more unlikely. Events proved this to be so, and the Government had to come to the rescue of the Commission and finance its deficits.

It is purely accidental that the National Coal Board and not the British Transport Commission is now under examination by the Select Committee. This is because the Coal Board report appears earlier in the year than that of the Transport Commission. If the committee of 13 members, meeting once a week and only when Parliament is in session, is to fulfil its task of examining the report and accounts of the nationalised industries effectively and make useful sessional reports to Parliament, it can consider only one nationalised industry during that session.

Of all the nationalised industries, transport has been subject to more political and ministerial interference than any other, and has suffered accordingly. What nationalised transport needs is freedom to devote itself to its many urgent tasks, with suitable—and not excessive—guidance from a sympathetic Minister; few would say that Mr. Watkinson does not express his views on matters affecting the railways, for instance. How far relations between the British Transport Commission and the Treasury are satisfactory to all concerned it is impossible to say.

Consideration by the Select Committee of the nationalised transport industry seems to be a case of pulling up a plant to see how it grows. The examination must take up a great deal of time of transport officers and their staffs which would better be spent on their already heavy tasks. With goodwill on the part of the Minister of Transport, the Treasury, and the Commission, it should be possible to reach agreement between them on such matters of broad policy as are outstanding. It seems doubtful whether there is any question peculiar to transport—as opposed to matters common to all nationalised industries—which would be worth examination by the Select Committee, however helpful its intentions, in view of the disturbance caused. The nationalised transport undertaking should be left alone.

Trans-Zambesia Railway

THE report for the year ended December 31, 1956, of the Chairman, Mr. V. L. Oury, and the Directors of the Trans-Zambesia Railway Co. Ltd., shows that operating receipts amounted to £1,011,813 compared with £872,994 in the previous year, whilst expenditure, including provision for renewals, was £761,545, representing 75·27 per cent of the gross receipts, compared with £633,061 (72·52 per cent) for the previous year. The net operating surplus was, therefore, £250,268 compared with £239,933 for the year 1955.

The following are some of the principal results:—

—	1955	1956
Total tonnage	687,125	799,878
	£	£
Passenger traffic receipts	106,941	100,728
Goods traffic receipts	738,343	877,161
Parcels and luggage receipts	14,292	14,380
Livestock and vehicle receipts	4,846	5,143

The company received a further sum of £177,000 from the Government of the Federation of Rhodesia and Nyasaland, making a total of £227,000 up to December 31, 1956, out of the total amount of £475,000 which that Government agreed to advance to the company to cover the cost of rolling stock and ancillary works to be provided under the second and final phase of the company's five-year programme of capital works, covering the period 1953-57. The expansion of business in 1956, Mr. Oury states, brought little benefit to the company since the additional revenue earned was almost entirely absorbed by increased

costs, due largely to the cost of giving effect to the provisions of the new law governing the conditions of employment of staff in the Province of Moçambique which, among other things, necessitated the employment of additional staff and granting of overseas leave with paid passages to all personnel affected.

The tonnage handled at the port of Beira—2,607,784 metric tons—shows a reduction of approximately 5 per cent on the previous year's record figure of 2,763,509 metric tons. This was only to be expected with the opening of the new rail link between Southern Rhodesia and Lourenço Marques which had its first full year of operation.

Freeman, Fox & Partners Centenary

ALTHOUGH the consultant engineering firm of Freeman, Fox & Partners, which celebrated its centenary this week, does not devote itself solely to railway matters, its contributions in this field are very considerable and the firm possesses a fine railway tradition dating back to its foundation in 1857. Sir Charles Fox had followed an apprenticeship in mechanical engineering by eight years of railway construction experience under Robert Stephenson before founding the firm of Sir Charles Fox & Son with his elder son Douglas. During that period he had worked for several years on the London to Birmingham Railway.

From 1858, when Fox was appointed Consulting Engineer on the Cape Town Railway & Dock Company's construction of the first African railway (Cape Town-Wellington) and, later, the Wynberg branch, to the present, the firm has been responsible for many overseas lines. These include 190 miles of new railway in Queensland; the Toronto & Nipissing Railway; the Arkonam-Cuddalore line in India; the continuation of the Cape Government Railways main line to Kimberley; the Liverpool Overhead Railway, now being demolished (believed to be the first railway to use multiple-unit electric traction and electric automatic signalling, both advocated by Mr. (later Sir) Douglas Fox); the Snowdon Mountain Railway; the Marylebone to Rugby section of the Great Central Railway; the Central London tube railway (the first in London); parts of what is now the Northern Line of London Transport (in association with Mr. J. H. Greathead); railways in Angola, the Argentine, Chile, Brazil, and Colombia, and, from the last decade of the 19th century to the present, the railways of Rhodesia.

Although Sir Charles Fox previously had been a contractor and, together with Mr. John Henderson, had designed, fabricated and erected the Crystal Palace in 1851, his and the firm's subsequent interests were mainly concerned with railway matters until 1902. In that year the firm, now styled Sir Douglas Fox & Partners (Sir Charles had died in 1874), undertook the design and construction of the Victoria Falls Bridge over the Zambesi and entered a new field of engineering. This initial triumph was followed by the design of the magnificent Sydney Harbour Bridge. This design was produced by a staff under the direction of Mr. (later Sir) Ralph Freeman, who had been personally appointed consultant to the contractors, Dorman Long & Co. Ltd. Other important bridges followed. Two out of four in Africa incorporated many new features and were the first two large bridges to be built of high tensile structural steel. Of the other and varied non-railway work undertaken by the firm reference must be made to the structural design of the Dome of Discovery of the Festival of Britain (1951).

Despite these added interests, Freeman, Fox & Partners (as the firm is now styled) still undertake considerable railway work. This includes the reconstruction work at Cannon Street Station and other work for British Railways and the continuance of the firm's 60-year association with Rhodesia Railways. In connection with this, a special department is maintained to ensure that all indented requirements are economically supplied and that manufacture and product meet specifications. This service is also performed for the Benguela Railway.

Much is heard today of the undesirability of foreign influence in countries overseas and it is sometimes claimed that no return is made by home governments for wealth gained as a result of development. In these claims, the great number and utility of such projects as those referred to above are often forgotten. Nevertheless, the works themselves bear testimony to the excellence of British engineering and such firms as Freeman, Fox & Partners continue to satisfy a demand for services which shows no sign of diminishing.

Narrow-Gauge Lines in South-West Africa

THE railway lines in South-West Africa form an integral part of the South African Railways. In a further effort to increase the carrying capacity and promote efficiency it has been decided to widen the narrow-gauge (2-ft.) lines between Kranzberg and Tsumeb, 250 miles; Otavi and Grootfontein, 57 miles; and Otjiwarongo and Outjo, 44 miles, to 3 ft. 6 in. at a cost of £6,250,000. The major part of the necessary earthworks will be done by private contract under supervision of railway engineers, and tenders will be invited in the near future. Engineers are now surveying the terrain, for although the new lines will in certain areas follow the routes of the old, some deviations will be necessary to eliminate sharp curves. The new line will consist of 60-lb. rails laid on steel sleepers with 1,200 cu. yd. of stone ballast per mile. Two major bridges, one across the Kahn River, and the other across the Omaruru River, are to be built.

A construction office is being opened at Otjiwarongo where temporary housing will be provided and tenders have been invited for the delivery and erection of 20 prefabricated houses. The engine shed at Usakos is being enlarged at a cost of £70,000 to take the bigger locomotives.

To the south-west of Usakos, from where the existing narrow-gauge line runs in a northerly direction, lies the Namib desert, stretching as far as Swakopmund and Walvis Bay. Under the German régime two narrow-gauge lines ran roughly parallel from Swakopmund to Karibib. At Karibib, the line known as the Northern State Railway Line, branched off towards the east to Windhoek, and the Windhoek-Karibib section was later changed to a 3-ft. 6-in. gauge. The other narrow-gauge line, in those days the more important of the two, branched off at Kranzberg to the copper mines at Tsumeb. With the opening of the Northern State Railway Line, the Walvis Bay line fell out of use and the service was discontinued in 1904. The major part of the track, which consisted of 12½-lb. rails and light steel sleepers, lies buried beneath the sand and only the small nine-ton locomotive which stands on a pedestal in front of the station at Windhoek serves as a reminder of this once popular line. The narrow-gauge line from Swakopmund to Windhoek did not, however, meet all the requirements, and the Windhoek-Karibib section of 118 miles was altered to 3-ft. 6-in. gauge in 1911, but the Karibib-Swakopmund section was not converted.

The building of the line between Swakopmund and Tsumeb, 353 miles, is the result of finding rich deposits of copper ore requiring movement for export from the copper mines at Tsumeb and Otavi to Swakopmund. The Otavi Minen und Eisenbahn Gesellschaft, a company established in 1900 for the mining of minerals in South-West Africa, instructed Arthur Koppel of Berlin, in October, 1903, to build a railway line 60 cm. wide, between the two centres. It was known at the time as the longest narrow-gauge line in the world, and after many difficulties was completed in 1906.

When the 57-mile Otavi-Grootfontein line was proposed at the turn of the century, its extension eastwards to Rhodesia was considered. Cecil Rhodes was interested in this project, and with the establishment of the Bechuanaland Railway Company, recommended the building of

such a narrow-gauge line. Rhodes was persuaded, however, to abandon the project and a 3-ft. 6-in. gauge line was built through Bechuanaland from Mafeking to Rhodesia instead. The plan to extend the Otavi line to Ovamboland had to be abandoned because of the 1914-18 war. The Otavi-Grootfontein line was eventually built in 1908.

In 1915, the South African Engineering Corps started at Swakopmund to rebuild to 3-ft. 6-in. gauge the Otavi narrow-gauge line which was broken up and removed to the interior by the retreating German army. By August, 1915, the line was completed from Swakopmund to Usakos where the German narrow-gauge workshops were situated. To connect the 3-ft. 6-in. gauge line from Swakopmund with the line of the same gauge between Windhoek and Karibib, a third rail was added to the narrow-gauge line over a distance of 7½ miles between Usakos and Kranzberg junction. Further north of Usakos, as far as the termini at Tsumeb and Grootfontein, the demolished narrow-gauge line was restored by the South African Engineering Corps, and in July, 1915, it was put into use. The old German narrow-gauge line from Swakopmund to Karibib via Jakkalswater was demolished in 1916, and in 1924, when the three rail line between Kransberg and Usakos was rebuilt on an improved track, the connecting line Ounguati-Karibib was likewise demolished. The remaining 22 miles of the narrow-gauge branch line from Otjiwarongo to Outjo was completed by the South African Railways in 1921, after the first 22 miles had been laid by the German Government in 1914 as part of the line to Okahakana.

Applying U.S.A. Diesel Traction Experience

THE experience of railways in the U.S.A. with diesel traction and the application of it as a guide to the introduction of diesels in other countries were the theme of the paper presented to the Institution of Locomotive Engineers on December 18. This was read by Mr. H. G. McClean, who is Export Manager of the General Motors Corporation Electro-Motive Division, La Grange, Illinois. Entitled "American Experience as a Guide to Main-line Diesel Locomotive Application Overseas," the paper is in two main parts.

The first section deals with the development for diesel traction on U.S.A. Class 1 railways from 1935 to 1955 with reference to the variations of traffics and operating costs. As the author points out, the most important factor in this 20-year period under review was the introduction of the diesel locomotive.

In the second part of the paper, Mr. McClean deals with the experiences of some overseas railways systems in introducing diesel traction, compares them with American experience, and makes some observations as to the most likely ways of taking advantage of experience gained in the U.S.A. No overseas railway has gone over to diesel traction to the same degree, or over so long a period, as have railways in the U.S.A. Therefore comparisons must be on the basis of less extensive operation.

Although particulars are not available which allow of an accurate detailed comparison of overseas with U.S.A. railways in such matters as variation in traffic volume, revenue, operating costs and investment, he does make some general comparisons. Because the introduction of diesels to overseas railways is generally comparatively recent, he deems statistics to be of value only over the five-year period 1951-55. In this period traffic generally increased by the order of 10 per cent, that is, by 2 per cent per annum, as measured by ton-miles, which is about the same as on U.S.A. railways. Measured by ton-miles, the percentage of traffic represented by passenger service is much greater overseas than in his country. With individual overseas railways it varies from 50 per cent maximum to 20 per cent minimum, showing that passenger traffic is more important there than in the United States. Railcars find wide application overseas for passenger traffic. In the five-year period the portion of total passenger traffic handled by railcars has increased roughly from 20 per cent to 30 per cent of the total or by 2 per cent per annum. However, this type of vehicle is little used on American railways.

The introduction of diesel haulage in America resulted in a substantial increase in the length and weight of trains; with overseas railways there has been some increase in train size, but the increase is relatively slight. Similarly, it is noticeable that railways which have electrified have not substantially increased train sizes either. It appears to the author that mechanical limitations such as coupler strength, the layout of the railway sidings and turnouts, as well, perhaps, as the philosophy of operation, tend to encourage increase in frequency and speed rather than increase in train size, as far as overseas systems are concerned.

Unit rates for overseas and U.S.A. passenger and freight traffics seem to have all increased approximately 3 per cent per annum. Mr. McClean points out that the rate of increase has been more rapid in recent years. In a similar manner, the proportions of the total operating costs represented by maintenance of locomotives and fuel cost together which represent 10 per cent of total operating expense, and vary over a limited range of 8 per cent to 16 per cent, is also common.

He strongly advocates making traffic studies, such as have been widely applied in the U.S.A., before any decision to introduce diesel traction is made. These will generally be primarily concerned with determining the size and weight of the locomotives best suited to handle the traffic, and therefrom the train performance and running time; the total engine miles required to handle the volume of traffic; and the number of locomotives required to handle the traffic, and the facilities for their maintenance.

He stresses the importance of recognising that the output from the diesel locomotive over its working range is so specific that the train performance can be calculated in advance with great accuracy. In summarising the traffic conditions for overseas operations, he observes that consideration of a proposed plan for diesel introduction should be precise; that on those railways the ratio of annual diesel to steam engine miles, or the number of diesel locomotive units which replace steam, is 2½ or 3 to 1, which is higher than in the United States; that increase in train size is likely to be small; and that overseas traffic patterns are likely to involve reduced engine miles per locomotive with increased diesel haulage, and that this reduction may amount to 10 per cent at half, and 25 per cent at full diesel working.

In discussing the trend of design features of overseas locomotives, Mr. McClean observes that, as in America, diesels were first applied for shunting purposes, but were of the 0-6-0 arrangement with side rod drive of 200-400 h.p., compared with the traditional four-axle, double-bogie design of 600-1,200 h.p. With line-service diesels, although multiple-unit operation has been one of the most important factors in the U.S.A., it has not proved very attractive to other railways. Generally, locomotive controls will be arranged for such operation, but its use is occasional rather than normal. This bias towards single-unit operation has led to some general standardisation of size of overseas diesel locomotives. Universally they are of the double-bogie type and of two main sizes: 1,500 to 1,800 h.p. on six axles weighing 100 tons, or 1,200 to 1,500 h.p. on four axles weighing 70 tons.

In the development of overseas designs, five important factors have lead to major differences from U.S.A. standards. These are wide variation of track gauge; lighter axle loads; limited loading gauges; variation of coupler; and capacity and weight.

On the question of axle and wheel loadings, the author believes that, generally, rail stresses caused by diesel locomotives, are considerably less than the steam locomotives they replace, and states that in the U.S.A. axle-loads some 25 per cent greater were accepted for diesels compared with steam units, without subsequent damage to track. This, he thinks, is a result of longer bogie wheelbase, and absence of dynamic augment on the diesel. He is also of the opinion that there has been insufficient attention to the lateral (compared with vertical) effects of the diesel

locomotive on the track; bogie construction and lateral flexibility at the axlebox possibly contributing considerably, he believes, to reduce adverse track loadings by diesels. Such a large increase in permissible axleload does not seem to be shared by many railway systems outside the U.S.A.; it remains to be seen whether it will ever, in fact, become widely accepted elsewhere.

Ceylon Government Railway in 1956

WE have received from Mr. B. D. Rampala, General Manager of the Ceylon Government Railway, a copy of his report on the administration of the Railway Department for the year ended December 31, 1956; the accounts and statistics in it refer to the financial year ended September 30, 1956. That year was again marked by the highest revenue earned since the inception of the railway, but salaries and wages increased greatly and the cost of coal rose from Rs. 65 to Rs. 84 during the financial year. Consequently, working expenses rose by Rs. 5,320,000, and despite an increase of Rs. 3,940,500 in revenue there was a loss in working of Rs. 10,714,000. Some of the more important results of the year's working compared with those during 1954-55 are given below:—

	1954-55	1955-56
	(Thousands)	
Passenger journeys	50,391	52,363
Goods ton-mileage	176,173	187,647
Passenger train-miles	4,208	4,591
Goods train-miles	1,984	2,029
	(Rs. thousands)	
Passenger receipts	28,363	30,372
Railcar receipts	249	257
Parcels, mails, &c. receipts	4,716	4,980
Goods & livestock receipts	36,710	38,478
Total revenue	74,019	77,960
Working expenses	83,354	88,674
Deficit	9,335	10,714

One of the principal aims in the year's work was the implementation of the expert opinions expressed upon the railway by the United Kingdom Railway Commission, the Railway Departmental Investing Committee, and Mr. Badhwar, former Chairman of the Indian Railway Board. Suggestions from various sources for improvements continued to be received and were carefully considered and those that were practicable were adopted. Implementation of the Commissioners' recommendations is already paying good dividends in efficient operation and increases in traffic, showing better public confidence in rail transport. A complete change in railway operation, particularly in the Colombo area, was likely within the next few years; Colombo station was to be remodelled and modernised. Air-conditioning of coaches had already been begun, and the relaying of the Batticalda-Trincomalee light railway with heavy rails was being carried out as rapidly as the supply of materials allowed. A new bridge was also under construction over the Alut-Oya on the Galoga-Trincomalee section, partly to meet the needs of irrigation.

The route-mileage open for traffic during the year under review totalled 898 miles, of which 811½ were of 5 ft. 6 in. and 86½ of 2 ft. 6 in. gauge; 63 miles of broad gauge were double line. Two old 100-ft.-span bridges which were corroded and too weak for modern traffic were replaced by new spans; other weak bridges and culverts were strengthened or renewed. Five "M.1" class, and one "M.3" class (locally built) and three "M.2" class (given by the Canadian Government) diesel-electric locomotives, all of broad gauge, were placed in service during the year. Thirty new 55-ft. suburban-type coaches were also built locally on imported underframes. Three aluminium-panelled and specially liveried train sets to form the *Yal Devi* and *Udarata Menike* expresses were also turned out. Work was begun upon the new carriage shop and the laboratory research shop.

In fact, 1956 saw steady progress upon the railway modernisation programme, and there were no strikes, other disturbances, floods, washaways, accidents or notable interruptions to train service. An improved train service came into force in April, 1956, and punctuality improved, but cost per train-mile was reduced. Turn-round of wagons improved, and 66 per cent of consignments reached their destinations on the day or the day after they were handed over to the railway. In spite of continued acute road competition revenue earned increased appreciably. Mr. Rampala concluded by promising the early introduction of more fast express trains and a reorganisation of the suburban services when the new four-coach diesel suburban trains on order were in service and with the installation of colour-light signalling.

Letters to the Editor

(*The Editor is not responsible for opinions of correspondents*)

Coat Hooks in Passenger Stock

December 4

SIR,—The travelling public was asked recently to express its views regarding travel comfort in the new British Railways passenger rolling stock. We, who both travel extensively by train in this country feel that an important item has been omitted in the interior equipment of the ordinary passenger coaches and also in the rather more recently introduced diesel railcars: there is a complete lack of coat hooks or pegs in the compartments and saloons in British Railways coaching stock.

One does not expect to have to lay a garment on the baggage rack amongst suitcases, and so on, which may well be soiled or sooty. One's overcoat may be damp, in which case it is certainly more desirable to be able to hang it up to dry. In a long-distance train the baggage rack is often crowded with baggage and parcels, and it only adds to the confusion to put garments in the rack; and also one's overcoat pockets are readily accessible when the coat is hanging up.

We hope that coat hooks will become standard fittings in coaches, as is common practice elsewhere in Europe and indeed in the world.

Yours faithfully,

A. JOHNSTONE-WEATHERBE
J. MCCLYMONT

Valleyfield, Ringford, Castle Douglas, Scotland

Diesel Cars for Official Tours

December 9

SIR,—The editorial note in your December 6 issue commending the use of diesel railcars for inspection purposes recalls how effective and efficient single-unit cars were in Italy during and immediately after the last war. The American Military Railway Service converted a number of Fiat, OM, and Breda cars to carry a limited number of passengers in comfort by the provision of a small bedroom, various arrangements of bunks, and a day room, where meals could be taken in armchair comfort round a table. Cooking was undertaken on a specially installed stove, though today meals doubtless could be on-loaded at selected points in keep-hot containers.

I had the pleasure of many trips in such coaches, but the outstanding success was a journey in a converted Fiat railcar, placed at our disposal by the Italian State Railways, from Rome to Prague for the first postwar European freight conference, arranged by the Czech Ministry of Transport and the European Central Inland Transport Organisation.

Our route was via Ancona (the Florence link was not then re-opened), Bologna, Milan, Verona, over the Brenner to Innsbruck, and on via Kufstein and Munich. On the sector between Kufstein and Munich, the Italian crew demonstrated to the Bavarian pilots that 126 km.p.m. (78 m.p.h.) was well within the capabilities of the car. Over the Austrian sector, we had the unique experience of being hauled by an Austrian Federal Railways electric locomotive.

Yours faithfully

AUBREY C. PING

59, Grosvenor Avenue, Carshalton, Surrey

THE SCRAP HEAP

Dearer for Dodgers

The British Transport Commission decision to increase the price of platform tickets to twopence should surely not be allowed to pass without mild protest. In one fell swoop they have doubled the cost of free travel.—*From a letter to "The Evening News."*

Wage Claims in 1897

According to our Glasgow correspondent the canny railwaymen of the North are not likely to be so foolish as to be drawn into the conflict which the English agitators are endeavouring to bring about. The Scotch officials have exactly the same tale as their English confrères to tell, namely, that working expenses are already as high as the position warrants and as concessions have recently been made in regard to hours and payment for overtime and for Sunday labour, there is really no excuse for a strike.—*From "The Financial Times"* of December 4, 1897.

Diesel Noises

Little did we country dwellers realise how well-off we were in the good old days of steam. The gentle, almost apologetic whistle at our local level crossing was more like the clandestine signal of a lover beneath his lady's window. But now! You would imagine and with reason, that the walls of Jericho surrounded each and every cottage and field, and that they must be flattened at all costs.

Not so long ago there was a fashion for music-minded motorists to affect a horn which played a little tune. Could not Coras Iompair Eireann afford a horn like that, and play the first bar of the chorus of "The Kerry Dances"? No doubt the reaction of some railside dwellers would be to seek immediate refuge under the bed as before. . . If these suggestions aren't accepted, maybe C.I.E. would issue toffee-apples to their drivers? It might at least keep one hand off that ghastly horn-button; a boxing-glove would soften the blow. . . You should try sleeping anywhere within a three-mile range of a line where the heavy-duty diesel-electric locos operate at night. If you did, you'd soon learn the true meaning of the word "loco."—*From "An Irishman's Diary," in "The Irish Times."*

Night Train to Baghdad

Fourteen shillings is not a great deal to pay for a 450-mile journey; but then we did not travel third class from choice. . . . Wooden benches, each seating three, were placed across the carriage, with a continuous bench running the length of one side. The harsh bright light was provided by two bare bulbs. Doors at either end of the coach gave on to open platforms connecting the coaches—these platforms, although not intended as such, served as gentlemen's conveniences. . . .

When we arrived at Ur, or rather Ur Junction as the station itself is called (I wonder if there is a Carthage Halt or Nineveh Sidings?), a few people got off. . . . I was able to clear a space on one of the luggage racks and . . . doze for a few hours.

We arrived in Baghdad at 9.30 a.m. after 15 hours' travel . . . comforting ourselves with the thought that not only had we saved money but that had we, as originally intended, travelled second class, we could not have reached Baghdad a moment sooner.—*From "The Times."*

Destination Undesignated

A dog which ate its luggage label on a train journey from Scotland, was claimed 10 days later by . . . a shepherd at Brough, near Hull.—*From the "News Chronicle."*

Quicker by Rail?

As far as could be learnt from inquiries this afternoon, three adventurous pigeons are still hopping and flying round the bottom level of the Trafalgar Square Underground station. Suggestions that they went down 70 ft. in decorous fashion aboard the escalator can be discounted. At least one of the birds . . . was seen to fly down the stairs, hover over the ticket office for a second or two as if deciding where to go, and then to wing its way resolutely downwards at an angle of 45 degrees. Two others were already at the bottom.

They showed no particular alarm at the noisy approach of the trains. Indeed, one showed signs of trying to board the Bakerloo south to the Elephant and Castle, where street life may be reckoned congenial for errant avifauna. The others nibbled bits out of the waste-paper baskets, skilfully avoided the passengers' feet, and got out of the way of a kindly City fellow who tried to nab them in his homberg.—*From "The Manchester Guardian."*

Happy Christmas

We, who in Scrap Heap's modest page,
Most of the year abide,
Send seasonal good wishes to
Our readers, far and wide.

This interregnum of good cheer,
Naught can resist its glow;
It brings a thaw to human hearts
And conquers ice and snow.

Good company in the waiting-room,
A glow within the grate,
And we shan't worry if "the branch"
Is running a bit late.

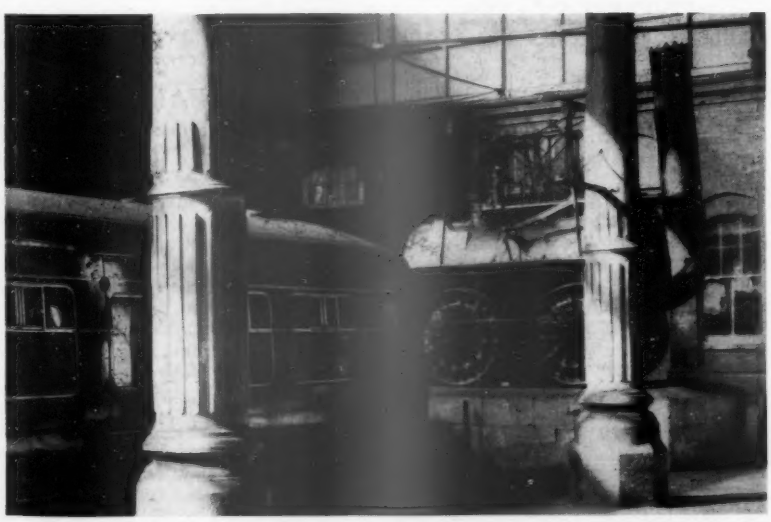
Diesels, electrics, steam and staff,
What Christmas owes to them!
Why, even their protagonists
Have grounded arms *pro tem.*

Let sputniks come and sputniks go
Careering round the earth;
Why should we let them interrupt
Our modicum of mirth?

So, readers all, whate'er your clime,
Wherever you may roam,
A happy Christmas to you all,
With love from all "at home".

A. B.

Motive Power Contrast at Darlington



Multiple-unit diesel train about to depart for Saltburn from Darlington Station, North Eastern Region; it stands next to Stephenson's "Locomotion"

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

SOUTH AFRICA

Road Vehicles for S.A.R.

It is announced in South Africa that an order has been placed with a Glasgow company for a fleet of 20 heavy-duty passenger vehicles for the country road motor transport services of South African Railways.

RHODESIA

Developments at Bulawayo

A fenced carriage stabling area has been authorised for Bulawayo, to accommodate the increasing quantity of coaching stock being acquired. Facilities are to be provided for cleaning, washing, and watering of coaches; and space will be available for the making up of stock into trains.

A small motive power depot with refuelling facilities is to be built at Bulawayo for diesel-electric locomotives. An additional 12 diesel-electric locomotives, now in course of delivery by the English Electric Co. Ltd. from the United Kingdom, are to be stationed at Bulawayo to operate the South East line to Lourenço Marques.

INDIA

Alternative Line on Assam Link

The Railway Board has sanctioned survey for an alternative line on the Assam Link from near about Domohoni to Alipurduar, on the North Eastern Railway.

Since the construction of the Assam Link in 1950, there has been interruption in traffic along this route almost every year during the monsoon season. The committee appointed by the Ministry of Railways recommended an alternative rail connection for a part of the route between Siliguri and Alipurduar.

Cinema Car Withdrawn

The cinema-cum-buffet car which had been running since November, 1956, in the up and down Howarh-Delhi Janata expresses between Jhajha and Kanpur (Cawnpore) has been withdrawn.

WESTERN AUSTRALIA

Power Accounting

Late in 1953 a contract was entered into with International Business Machines to install electronic power accounting in the Accounts Branch of the Government Railways.

Initial difficulties in supply of machines, damage in transit, and some disorganisation due to voltage variation and alterations necessary to buildings and so on delayed the inauguration of the scheme, but the machines are now in full operation. They are estimated to save the Railways Department more than £18,000 a year. A bank of 33 machines is used for which an annual rent of approximately £20,000 is paid.

The payroll for the Department's 14,000 employees is processed automatically throughout. In addition, the machine provides an analysis of the staff employed and their distribution. At the end of the financial year it turns out completed taxation group certificates at the rate of 25 per min. There have been intangible savings in addition to the annual saving mentioned, and the previously large amount of overtime in the Accounts Branch has been eliminated. Further work to take up any unused capacity on the machine is being investigated, particularly in relation to stores accounting.

The installation is the most up to date in Australia and includes features entirely new to railway accounting in that country.

PHILIPPINES

Success of Diesel Traction

The replacement of 92 steam locomotives by 40 1,200-h.p. diesel-electric locomotives by the Manila Railroad has resulted in a working surplus for the first time in 16 years. The Manila Railroad is the largest railway on the islands. It connects Manila, with San Fernando, on the north-west shore, and with Legaspi, at the southern end of the island of Luzon. Previously it had been incurring annual deficit of some £500,000. In April, 1955, the new equipment was ordered from the General Electric Company, U.S.A., and was delivered and placed into service during 1956.

UNITED STATES

"Slumbercoach" Popularity

The Chicago, Burlington & Quincy Railroad reports that in their first year the "Slumbercoaches" on its "Denver Zephyr" services between Chicago, Denver and Colorado Springs—the first "roomette" or single room sleeping cars in the U.S.A. for "coach" passengers—carried 34,710 passengers. A questionnaire revealed, not only that 98 per cent of these passengers appreciated this new facility, but that 20 per cent of them had taken the train in preference to other forms of travel because this inexpensive sleeping accommodation was available.

Trebling Season Ticket Fares

An application has been made by the Boston & Albany Railroad—an affiliate of the New York Central System—for authority roughly to treble its season ticket fares in the area between Boston and Worcester, Massachusetts. It is claimed that the Boston "commuter" service at present is losing $2,600,000 annually, and the request is for a 206 per cent increase to be authorised.

This is in line with a recent statement by the President of the New York Central, Mr. A. E. Perlman, that his company would like, if it could, to get out of the commuter business altogether, and would be glad to sell or lease its facilities round New York, Boston and other cities to any rapid transit authorities prepared to take them over.

Illinois Central Passenger Services

In a recent public statement, Mr. Wayne A. Johnston, President of the Illinois Central Railroad, announced that the decline in passenger travel over his line had been arrested in 1955 and that passenger patronage had since remained steady.

Recently the "Panama Limited," the all-Pullman service between Chicago and New Orleans, has been made 45 min. later on the northbound run, so that this express in both directions now starts at 5 p.m., and arrives at 9.30 a.m., covering the 921 miles each way. with 14 regular and 5 conditional stops, in 16½ hr. Its fastest booked run is timed at 81·1 m.p.h. start to stop.

ALGERIA

Oil Traffic from Touggourt

Oil from the Saharan wells in the Hassi Messaoud region is expected to be pumped to the railhead at Touggourt in the near future, probably in January. The pipes for the desert pipeline were conveyed over the narrow-gauge Biskra-Touggourt line on wagons with interchangeable bogies, as described in our issue of October 25 . The line has now been converted to standard gauge in readiness for the oil traffic.

SPAIN

Diesel Traction for Narrow-Gauge Line

The narrow-gauge line between Leon and Bilbao, via Matallana, Cillamallor, Mataporquera, Llano, and Cidad, is to be modernised and worked by diesel locomotives which are being built by a Biscay works. This railway runs for some 212 miles across the provinces of Palencia, Santander, Burgos, and Alava, and is much used by tourists.

EASTERN GERMANY

New Baltic Train Ferry

The keel has been laid at Rostock of a new train ferry for the Sassnitz-Trelleborg (Sweden) route. The vessel will be launched in 1958. It will accommodate 36 33-ft. long freight wagons. Garage space will be provided for 30 motorcars.

The Work of the Railway Clearing House

Varied services for British and Irish railways and steamship companies

Large conference room at the Railway Clearing House

THE dissolution of the Railway Clearing House as a body corporate on April 8, 1955, did not mean the end of its work or its usefulness to British Railways and other activities of the British Transport Commission. Its Secretarial and Traffic Departments still provide many services of the greatest importance to the nationalised transport undertaking.

The railway clearing system was instituted in 1842 with the object of facilitating the through booking and movement of passengers and goods, with the Railway Clearing House as a central and neutral establishment to apportion the receipts among the carrying companies. The Railway Clearing Act, 1850, gave the Clearing House legal status in securing the payment of declared balances, and under the provisions of the Railway Clearing Committee Incorporation Act, 1897, the Railway Clearing House became a body corporate with its own seal.

From then onwards many other duties were placed on the Clearing House by statute, and a wide range of miscellaneous non-statutory duties, beyond its original purpose as a Clearing House, were also performed for and on behalf of its members (British and Irish Railways) and other transport interests such as shipping companies.

The clearing system was administered on behalf of delegates appointed by the boards of the railway companies. Before January 1, 1948, each main-line company was represented by four delegates and each other party-railway by one delegate; and the day-to-day affairs of the House were controlled by a Superintending Committee of eight directors of the main-line companies appointed by and from the delegates.

On January 1, 1948, the undertakings of the railways in Great Britain, parties to the clearing system, were vested in the British Transport Commission, and the number of parties was reduced to five—British Transport Commission, London Transport Executive, Ulster Transport Authority, Great Northern (Ireland) Railway Board, and Coras Iompair Eireann. In addition, there were 14 non-party companies, including steamship companies, for whom work was done by the Clearing House.

The British Transport Commission was required, under Section 38 of the Transport Act, 1947, to prepare a scheme as to the property, rights, powers, and liabilities of the Clearing House, and, until otherwise provided by such a scheme, the Acts governing its constitution continue to have effect.

The Transport Act, 1953, did not change this position, and on February 4, 1954, Mr. John Boyd-Carpenter, who was then Minister of Transport & Civil Aviation, made an Order embodying the scheme submitted by the Commission. This provided for the transfer of property, rights, powers, and liabilities to the Commission, and for the staff to become servants of the Commission as from May 24, 1954. The scheme also provided for the dissolution of the Clearing House Corporation at a later date, when the Corporation had secured the transfer to the Commission of any foreign property and debts, to which the scheme did not apply. The body corporate ceased to exist in 1955, after publication of a certificate by the Minister in *The London Gazette*, *The Edinburgh Gazette*, and *The Belfast Gazette* to the effect that there was no longer any reason for its continued existence. The line of Chairmen, which had started with George Carr Glyn, afterwards the first Baron Wolverton, ended with Mr. K. W. C. Grand, General Manager, Western Region, British Railways.

Great pleasure was caused by the Commission decision to retain the name "Railway Clearing House" as descriptive of the organisation. A Management Committee of five members, with Sir Reginald Wilson, Member of the Commission, as Chairman, was appointed to control Clearing House affairs on behalf of the Commission. This committee was reconstituted later, and Mr. K. W. C. Grand became its Chairman.

Responsibilities of Committee

The committee is responsible for ensuring that the organisation functions to the best advantage in relation to the whole of the Commission undertaking and for the exercising of overall supervision of the work of the Clearing House and dealing with matters of importance. The committee meets as necessary for these purposes.

At its first meeting on May 17, 1954, the committee decided that overall supervision of the Clearing House should be exercised through a senior officer located at Eversholt Street; that Mr. T. J. Lynch (the then Secretary to the R.C.H. Corporation) should be appointed to that duty, with the title "Secretary, Railway Clearing House"; that subject to review as might later be desirable, the authorities previously vested in, and the responsibilities placed on, Mr. Lynch by the R.C.H. Superintending Committee should be exercised by him on behalf of the new committee; that the committee should meet at three-monthly intervals to receive reports from the Secretary on the staff and work of the establishment, and to deal with any matters of importance which might require their approval or decision; and that in the interval between meetings the Secretary should be responsible directly to the Chairman.

Organisation

The work of the Clearing House is organised in two departments, "Secretarial" and "Traffic," with common services catering for both. The Secretarial Department is concerned mainly with the provision of secretarial services for conferences and committees. These bodies deal with matters relating to nearly all branches of the Commission activities, and frequent meetings to discuss matters of mutual concern are arranged as need arises between Commission representatives and those of coasting liner and tramp shipping, airways, independent road hauliers, Government departments, trade associations, and individual traders. Certain other sections of work, although not strictly secretarial, are brought

within the department as an administrative convenience.

The Traffic Department is engaged mainly on accounting and auditing work on behalf of British Railways.

Secretarial Department

The Secretarial Department provides secretarial services for conferences and committees. These numbered 210 at the end of 1956. The services include attendance at meetings; preparation and circulation of agenda, minutes, reports, memoranda; collation of statistics; correspondence; filing; and recording. Books of regulations, instructions, charges, and so on, are prepared as required. During 1956, these services were provided for 1,992 meetings, most of which were held in the committee rooms at Eversholt Street. Accommodation was also provided at Eversholt Street for 167 meetings of committees for which the Clearing House did not perform the secretarial work.

At eight points throughout the country, there are Area Secretaries who work in conjunction with the Road Haulage Association to provide secretarial services for Road/Rail Negotiating Committees dealing with road licensing matters. They attended 995 meetings during 1956.

The Department is also responsible for the preparation, printing, and, where this is permitted, sale to the public of railway maps, the official "Handbook of Stations," rates books, scales of charges, and so on. In all, there are some 60 such publications. Amending leaflets or revised issues are published as necessary.

A central organisation was set up in 1949 to deal with all matters of classification of merchandise, previously dealt with by R.C.H. standing committees. With the introduction of new methods of freight charging on British Railways last July, based on "loadability" and not classification, the responsibilities of the Clearing House in this direction have been considerably modified. Matters affecting the carriage of dangerous goods and explosives continue to be dealt with by this section.

In 1950, a central organisation was set up to deal with all general claims and packaging matters previously dealt with by and through R.C.H. standing committees. The organisation includes a package-testing laboratory where packages and internal packings are scientifically tested and, if satisfactory, certified as suitable for the conveyance of goods at carrier's risk. Where packages fail the test, advice is given to the casemaker or trader on what modifications should be made. During 1956, 2,518 different types of pack were submitted for test, of which 80 per cent were certified as complying with the required standards.

A member of the staff represents the Commission on various "outside" bodies such as committees of the British Standards Institution concerned with packaging affairs. There is also regular collaboration with the principal casemakers and research services, and liaison—for the exchange of information and experience—with Continental and American railways.

An organisation set up in 1948 records, by mechanical (Hollerith) processes, all British Railways' wagon, coaching, container, sheet, and rope stocks. Before nationalisation, each main-line railway kept the records of its own stock, in some cases manually and in others by machines, and the R.C.H. kept the records of privately owned wagons. These individual records—which were not all kept in the same form—are now concentrated on the central registry as a complete uniform record of all stocks.

The records are kept up to date, involving the withdrawal of "condemned" stock, averaging some 25,500 items per month, and the inclusion of new stock, averaging 25,000 items per month.

A wide range of tabulated information is supplied weekly, monthly, quarterly, and annually, mainly for the Engineers', Accountants', Operating, and Commercial Departments, for purposes such as depreciation accounts, Commission published statistics, building programmes, and so on.

The Registry arranges the sale of condemned ex-privately owned wagons for breaking up or for internal use by collieries and so on. Some 3,500 a month are sold at a value of about £76,000.

Another function is the examination of consignments at goods stations and depots to determine the correctness of the consignors' declarations of weight and contents, and to ensure that consignments are adequately protected for normal transit and properly addressed and labelled. In the case of dangerous goods, consignments are examined to ensure that the correct warning labels are used and that packing and protection comply with the special regulations. Where necessary, the inspectors visit firms to give advice on these matters.

Inspectors also visit docks to correct the misuse of railway vehicles, wagon sheets, and other equipment. They ensure that proper charges are raised against the Port of London Authority for stock used irregularly in its docks, and clerks are stationed at those docks to assess demurrage charges on shipment traffic through the docks.

Traffic Department

The arrangements under which, before nationalisation, debits and credits were transferred between stations and other accounting points within the separate railway companies, and audited by the company, were extended on May 1, 1950, to cover transfers between any two points on British Railways. The monthly checking, auditing, and balancing operations are now concentrated at the Clearing House. The

(*Continued on page* 710)

The main entrance hall of the Railway Clearing House buildings in London

One of the small conference rooms available for the many committees meeting at the Clearing House

Developments in Spherical Roller Bearing Axleboxes—2*

Design improvements incorporated in C-type bearing

SKF C-type spherical roller bearing axlebox fitted to Metropolitan-Cammell diesel railcar sets operating in North Eastern Region

IN 1948-50, the SKF spherical roller bearing was developed into the latest design—known as the C-type—shown in Fig. 3 and the accompanying illustration. The carrying capacity of a roller bearing is increased to a greater extent by using larger diameter rollers rather than by increasing the number of rollers. For the new design of spherical bearing, therefore, the maximum possible roller diameter has been selected consistent with the sectional height of the bearing.

Fig. 1 shows that the effective roller contact length l_a is limited in the original spherical roller bearing by the grinding reliefs required with integral flanges. The width of the guide flange, which is necessary from a manufacturing point of view, also prevents full utilisation of the available bearing width. In the new bearings, see Fig. 3, the inner ring, as in the case of the narrow type, has no flanges and no grinding reliefs are therefore necessary. Instead, a loose guide ring, which is usually narrower than an integral flange, is fitted between the two rows of rollers. This means that the new bearings have a considerably greater roller contact length l_a than bearings with integral flanges.

Except for the difference in the end faces of the rollers, the rollers in the new bearings are symmetrical, that is the maximum roller diameter D_w is at the centre of the roller. The width of the guide ring is such that the resultant roller load Q acts through the centre of the roller. There is therefore no calculable component of the roller load acting against the guide ring. The roller load Q acts at the centre of the roller, irrespective of the direction of applied loading, since the loose guide ring permits the rollers to adjust themselves axially. Fig. 4 shows the position of the rollers in the case of a radial load (unbroken lines) and in the case of a thrust load (broken lines) in a bearing with a certain amount of diametric clearance. The point O is the centre point of the outer ring in the case of a radial load. Under the influence of a thrust load the outer ring is displaced, and its centre point moves to the position O′. In this instance it is assumed that the inner ring remains in its original position. The fact that the resultant roller load acts in the plane of symmetry of the roller means that the load is distributed symmetrically in relation to the centre of the roller, and consequently the distribution of the load is the best possible.

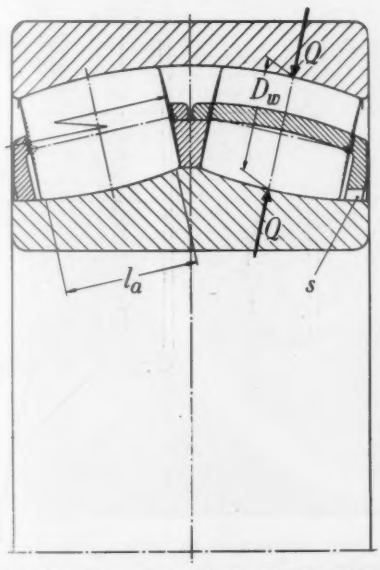


Fig. 3—C-type spherical roller bearing

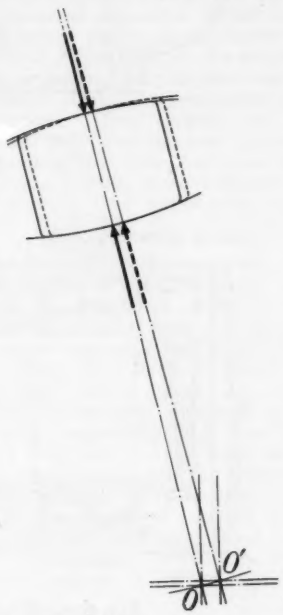


Fig. 4—Effect of clearance on C-type bearing roller

In a bearing with an integral guide flange the position of the rollers in relation to the inner ring is fixed. If the bearing has a certain amount of clearance and the load changes from a radial direction to an axial direction, the roller does not change its position. However, the contact point between the roller and the outer ring moves toward the outer end of the roller.

The ability of the rollers of C-type bearings to adjust themselves axially, as described above, has another important advantage. The rollers can have a very high degree of conformity, not only in relation to the inner ring, but

* Part 1 appeared in our issue of December 6

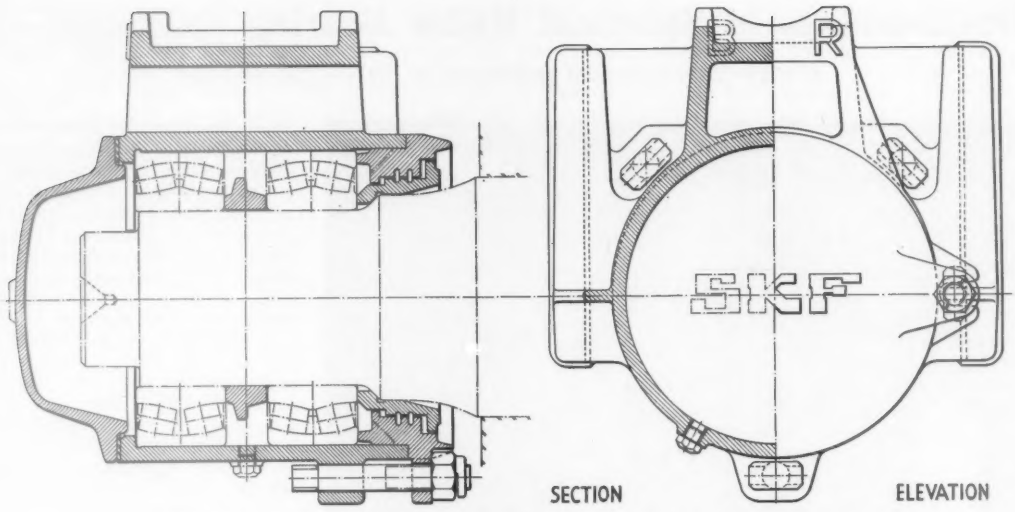


Fig. 5—Axlebox designed for British Railways standard goods wagons

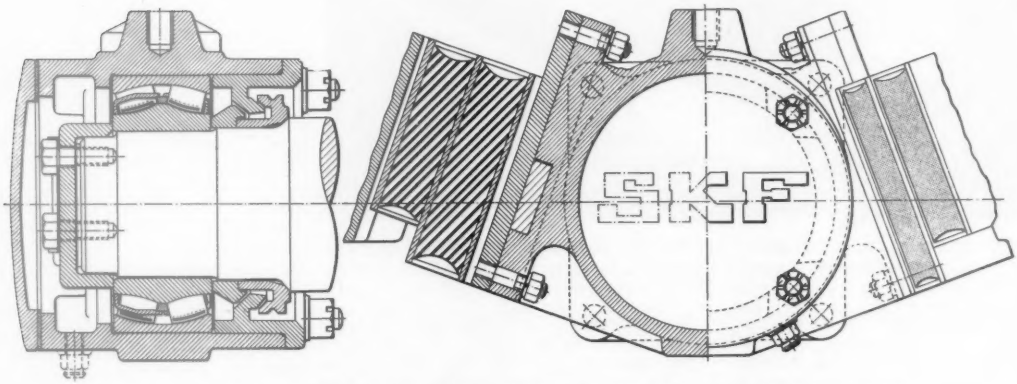


Fig. 6—Self-aligning axlebox for use with Metalastik chevron rubber suspension

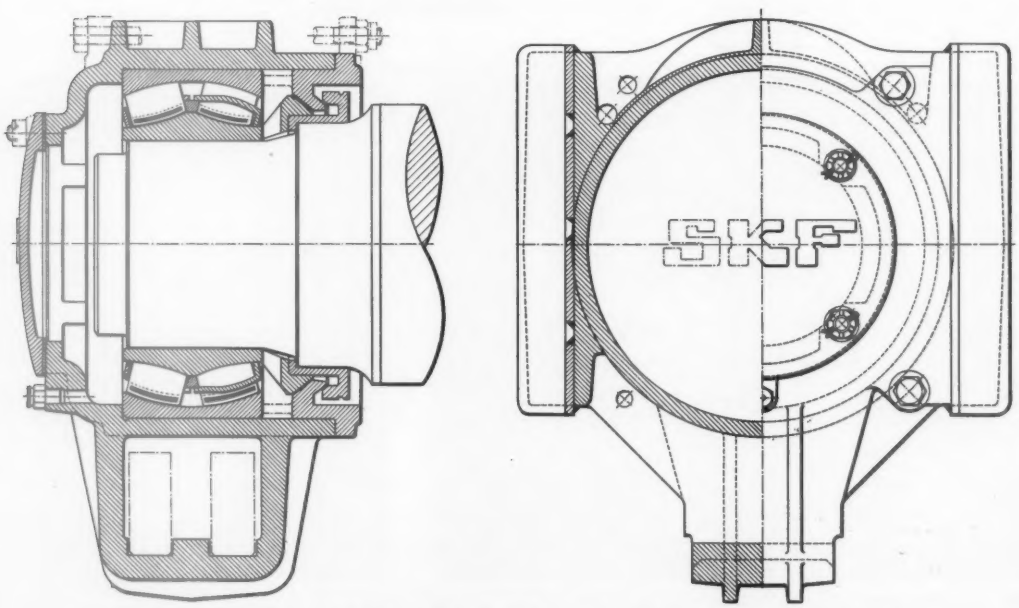


Fig. 7—Underslung axlebox for B.T.H. 800-h.p. Bo-Bo diesel-electric locomotive

also in relation to the outer ring. A degree of conformity giving maximum carrying capacity is, of course, selected; that is, one which under normal applied loads gives as uniform a distribution of load as possible over the whole length of the roller. Stress concentrations at the ends of the rollers are thus avoided, an advantage which cannot be achieved with any type of roller bearing where the generatrices of rollers and tracks are straight lines.

Increased Carrying Capacity

It has been estimated that these two factors alone—the close conformity and the uniform distribution of the load over the roller length—give an increased carrying capacity of approximately 15 per cent. In addition, better utilisation of the available bearing section and the absence of grinding reliefs combine to give a total increase of approximately 40 per cent. This, the manufacturer points out, means approximately three times longer fatigue life, a factor of no little importance.

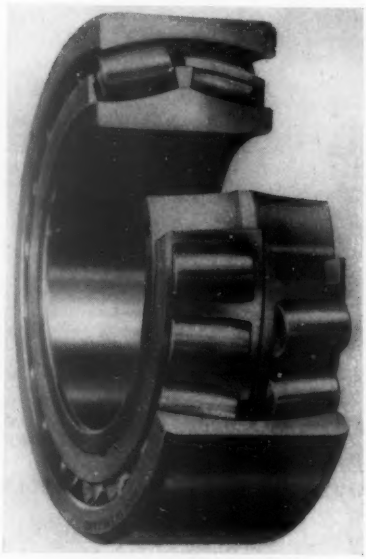
As there are no side flanges on the inner ring, the rollers must be retained by the cage when the outer ring is swivelled. A two-piece brass cage with "window" type roller pockets has been designed, which is centred on the guide ring and on the inner ring outside the rollers. The roller pockets are designed to assist the cage in guiding the rollers.

The rollers are retained in the cage by specially formed projections on the pocket spacer bars. When the bearing is assembled, the rollers are snapped into the cage pockets. A number of slots are incorporated in the side flange of the cage, as can be seen in the illustration, so that the rollers can be removed for inspection of the tracks of the inner ring. A special lever can be inserted through one of the slots and the adjacent roller levered out. The next roller can be removed by inserting the same simple tool through the empty cage pocket, and so on for the remaining rollers.

In applications where the load is heavy and radial space limited, extra wide spherical roller bearings are desirable, but there are limiting factors to the width of this type of bearing, one of them being that it must be possible to insert the cage into the outer ring. The cage construction of C-type bearings has made it possible to design wider spherical roller bearings and these enable a considerable number of bearing problems to be solved in a more satisfactory manner than previously.

The new spherical roller bearing has been introduced in a wide range of machines and equipment, and the results obtained are stated to have been extremely good. Meanwhile, spherical roller bearings of the original design with integral flanges on the inner ring retain their importance in various spheres, and certain series of these bearings are still in current production.

The accompanying illustrations and Fig. 5 show an axlebox of the type which is being fitted in increasing numbers to



The C-type, the latest design of spherical roller bearings

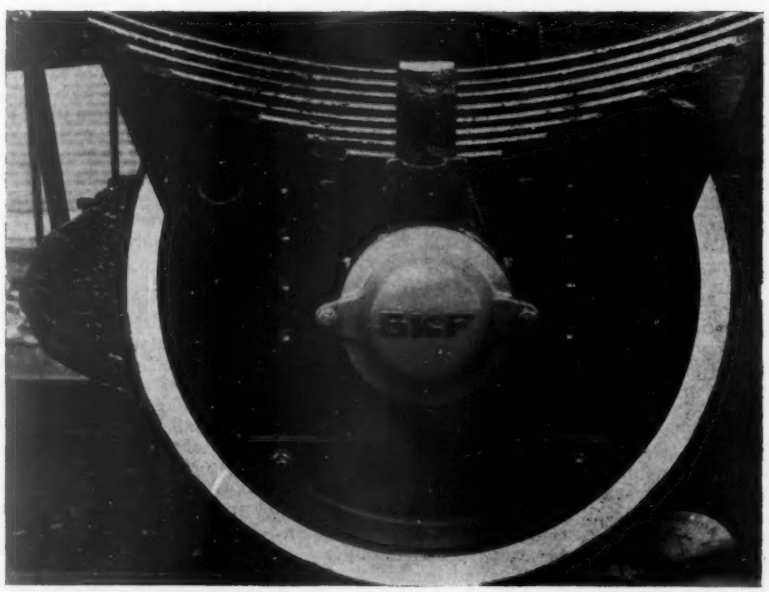
the 20/21-ton mineral wagons, and to tank wagons to run on British Railways, including a number of standard tank vehicles described in our issue of August 23, and which incorporates the new type of spherical roller bearing. The guides and unusually high spring seat are dimensioned to suit the existing axle guards and suspension of British freight stock, hitherto fitted with plain axleboxes for 10 in. by 5 in. journals. Only a slight modification to the sealing collar is necessary to make the box equally suitable for new axles or those being converted from plain bearings.

The axlebox is of robust design throughout, the main body being an integral steel casting which transmits the load direct from the spring to the axle journal through generously dimensioned spherical roller bearings. 11/14 per cent manganese steel liners are welded to the guide grooves.

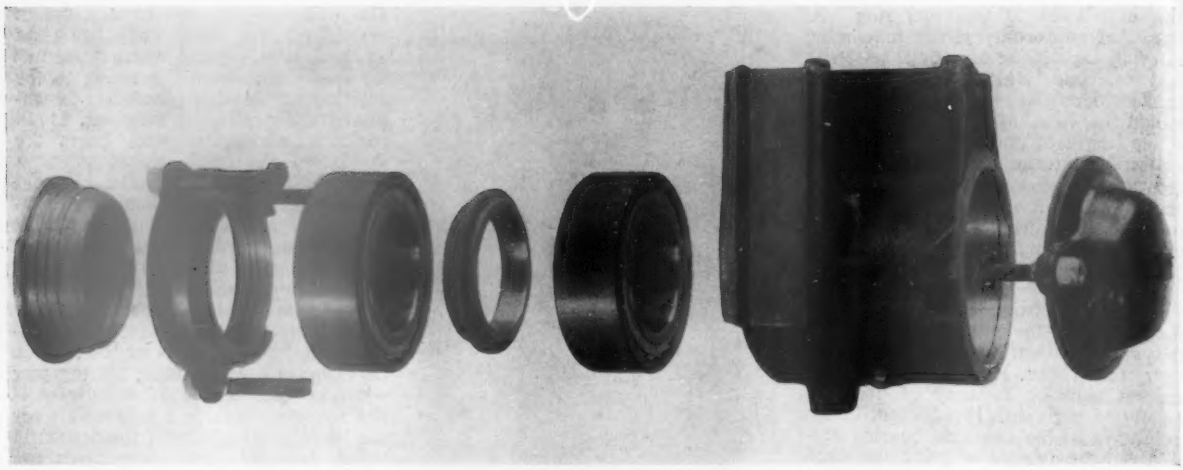
Because the spherical roller bearings are completely independent and self-contained, and do not induce thrust loads on one another, it is unnecessary to provide axial clamping of the bearing assembly at the end of the journal. This feature not only allows ready accessibility of the axle extension without disturbing bearings or box when chucking in a wheel lathe, but together with the fact that axial adjustment is not required, is largely responsible for the inherent simplicity of the design, in which only 12 main components are used, each of which is completely interchangeable. They consist of two spherical roller bearings and one forged steel spacer; one cast steel main body; three end-closure steel forgings; and five tee bolts with self-locking nuts.

Single Bearing Boxes

The simplicity and consequent economy which characterises the goods wagon box described above is to be found, to an even greater degree, in the single bearing boxes designed for application to British Railways' new lightweight railcar stock and diesel-electric locomotives. Illustrated on page 707 is the type of axlebox fitted to the diesel train sets which have recently come into service on the Newcastle-Carlisle section, North Eastern Region, being an example of a single bearing box with top loading. These particular vehicles were built by the Metropolitan-Cammell Carriage & Wagon



Axlebox fitted to four-wheel tank wagon, built by Charles Roberts & Co. Ltd., referred to in article



Component parts of goods wagon axlebox for British Railways incorporating two C-type spherical roller bearings

Co. Ltd., and are illustrated in Part 1. Fig. 6 shows an axlebox for a similar duty but for use with Metalastik rubber chevron suspension; Fig. 7 shows another design of single bearing box, in this case underslung, produced for the ten 800-h.p. Bo-Bo B.T.H. diesel main-line locomotives, the first of which was handed over to the London Midland Region on November 18, as recorded in our issue of November 22.

(Concluded)

The Work of the Railway Clearing House

(*Concluded from page* 706)

Traffic Department also carries out the audit of stations' monthly summaries of merchandise traffic by freight and passenger trains, covering the whole of British Railways.

Another activity is the operation of the "Warrant Travel" scheme, under which firms and other organisations can obtain tickets for any journey over British Railways, Irish railways, and independent steamship companies without payment at the time of booking, on presentation of a warrant at the booking office.

Each firm is required to deposit with the Clearing House a sum equivalent to roughly six weeks' expected travel. At the end of each month the railways and shipping companies send all exchanged warrants to the Clearing House, showing the fares chargeable. From these a monthly account is compiled mechanically and rendered to the firm. Payment is made to the Clearing House, which credits the railways and steamship companies with the value of the warrants exchanged. The number of accounts open at the end of 1956 was 4,026, and the total value of warrant travel in that year (to November 30) was more than £6 million.

The Clearing House is the channel through which railway stations and offices are supplied with accident and baggage insurance tickets and vouchers for sale at booking offices on behalf of the Railway Passengers Assurance Company, and through which receipts from this business are accounted for to the assurance company. Each station sends a monthly return showing tickets, and so on, sold and premiums paid, from which statements are prepared showing the amounts due to the assurance company from each Region or company, after allowing for commission.

The examination of G.P.O. returns and records for purposes of checking and agreeing with the Postmaster-General the amount due to the carrying companies for the conveyance of post-office parcels is performed by the Clearing House. The preparation—in collaboration with the Irish Clearing House—of accounts, and the apportionment of parcel post revenues between the carrying companies also is carried out. In 1956, the total amount involved was more than £9 million.

Yet another function is the division of receipts from through-booked merchandise traffic between British Railways and Southern Region Continental ports, for the purpose of ascertaining the proportions accruing to "rail" and "boat." This information is used in connection with the pool of cross-Channel receipts between British Railways and the French National Railways.

Common Services

The internal accounting section deals with the accounting of Clearing House expenses and proportionate charging out to administrations among its duties. The staff section is responsible for the annual census of all railway staffs, on behalf of the Railways Staff Conference, as well as many other duties.

The Railway Clearing System Superannuation Fund is an independent corporation. Its affairs are administered by a Council of six, five appointed by the British Transport Commission and one by Irish contributing bodies, with Mr. K. W. C. Grand as Chairman, and a Management Committee of 12 comprising the Council of six, and six appointed by the contributing members. Members and superannuitants include employees and/or retired servants of all branches of the Commission, certain Irish railways, and the Irish Clearing House.

Staff

In 1921, the staff of the Clearing House numbered 3,400, the majority being employed on the work of dividing traffic receipts between the many railway companies, British and Irish, then party to the Clearing System. With the considerable lessening of the need for such divisions following the amalgamation of railways in pursuance of the Railways Act, 1921, the later complete abolition of all receipts division (except cross-Channel and Irish traffic) following the Act of 1947, and the gradual introduction of machines for accounting and statistical purposes, the number of employees fell steadily to a figure of 455, all grades, on December 31, 1956.

INSTITUTE OF TRANSPORT METROPOLITAN SECTION.—The tenth annual report of the Metropolitan Section of the Institute of Transport, to which more than 25 per cent of all members of the Institute belong, shows that the Section had a successful year in 1956-57. Attendance at meetings in London was very good, and membership had increased from 2,258 at September 30, 1956, to 2,600 a year later. The newly-formed West Middlesex Group held a number of meetings in the latter part of the session and has a full programme for 1957-58. The meetings of the Essex Group at the Shire Hall, Chelmsford, are still not as well attended as they should be, and members in the area are urged to support the Group. Mr. A. J. Webb, the Chairman of the Metropolitan Section, retired from office on September 30 last, and the new Chairman is Mr. C. F. Klapper.

ELECTRIC RAILWAY TRACTION SECTION

Calcutta Electrification Inaugurated

THERE is a parallel between the Eastern Railway of India Howrah-Burdwan electrification, part of which was inaugurated by the Prime Minister, Mr. Jawaharlal Nehru, last Saturday and the British Railways, Eastern Region, Shenfield-Southend electrification. Both are d.c. schemes launched after the decision to carry out further work at 25 kV., single-phase, 50-cycle a.c. has been taken; so that the question must be faced either of converting the motive power already provided, or of having a changeover point where the two systems of traction meet. At present it is proposed to electrify westwards from Burdwan to Moghalsarai on the a.c. system, so that Burdwan will eventually become a junction between the 3,000-V. d.c. and the 25-kV. a.c. systems.

In Europe, a similar situation has occurred at Luxembourg, where the changing of locomotives on through trains has been facilitated by arranging for certain station tracks to be energised with either supply (see our April 12 issue). An unusual feature of the Eastern Railway undertaking, however, is the relatively circumscribed radius of action, compared with earlier intentions, of the new 3,120-h.p., Co-Co electric locomotives supplied by the English Electric Co. Ltd., and described on another page. These seem likely to be limited by the a.c. electrification plan to running between Howrah and Burdwan, while the fact, to which we drew attention in our November 29 issue, that they are the first 3,000-V. d.c. locomotives in India, would prevent their transfer elsewhere, although there is scope for new motive power on the Bombay to Poona and Igatpuri 1,500-V. d.c. sections of the Central Railway, to which the English Electric Co. Ltd. has already contributed the seven 3,600-h.p. units described in our issue of February 18, 1955.

As they are designed with the whole of the Howrah-Moghalsarai route, via the Grand Chord, in view, the Eastern Railway locomotives have the capacity to work 630-ton passenger and 825-ton parcels trains up a 1 in 80 gradient at 39·3 and 37 m.p.h. respectively, and to balance with these loads on level track at 71·1 and 57·6 m.p.h. They were not required to work freight trains over the steeply-graded Asansol-Gaya section of the Grand Chord, and the specified requirements for this traffic were to haul 2,300 tons at 44·6 m.p.h. on the level or at 38·2 m.p.h. up 1 in 400. Pending deliveries of new multiple-unit rolling stock, the locomotives are being used to operate suburban trains, and the Eastern Railway authorities have reminded the travelling public that this is a temporary arrangement which cannot demonstrate the full potentialities of electric traction for quick turnround and frequency of service. It may be recalled that a similar situation arose in the early days of the French National Railways electrification from Paris to Lyons, when Paris suburban trains were worked for a time by push-pull sets with Bo-Bo locomotives adapted for remote control from driving trailers. When the Calcutta scheme is more fully developed, it is planned to increase the number of trains running each way daily on the Howrah-Bandel and Howrah-Tarakeshawar sections from 35 to 90. The new multiple-unit stock is being built with an overall width of 12 ft. compared with the 10 ft. or 10 ft. 8 in. of steam stock. Seats will be provided for about 100 passengers in each vehicle, and normal standing accommodation for a further 100, although this number may be doubled in rush hours.

In our earlier reference to the new locomotives, their basic similarity to the Santos-Jundiahy Railway design was mentioned. This, in turn, contributed many features to the English Electric-Vulcan Foundry Co-Co design for the Spanish National Railways described in our May 9, 1952, issue, while the Central Railway locomotives already mentioned belong to the same general line of development. In these various designs, the English Electric Co. Ltd. may be considered to have produced a d.c. "world" locomotive capable of ready adaptation to different requirements. There will certainly be competition between manufacturers both at home and internationally to evolve a similar design for industrial-frequency a.c. systems, and builders in this country will soon have the opportunity to test their products on the first of the British Railways pilot schemes. The view has been expressed abroad that export possibilities for the British manufacturer must have weighed with British Railways in choosing the 50-cycle system. Whether or not this wise consideration prevailed in the first place, it is important that it should do so now, and that the railways and the locomotive industry should concert their efforts whenever the opportunity arises of demonstrating British products and development to overseas buyers.

Electrification Efficiency

A REMINDER of the effect on railway electrification economics of development in generating plant is contained in the 1957-58 Faraday Lecture now being delivered by Mr. G. H. F. Fletcher, Consulting Engineer to the Traction Department of the General Electric Co. Ltd., as recorded in our November 29 issue. It is recalled in the lecture that the average efficiency of all power stations of the Central Electricity Authority in 1956 was 25 per cent, based on kW.-hr. delivered to the Grid at high voltage. With the larger and more efficient power stations now under construction, the station efficiency will be increased from 25 to 31 per cent, which is estimated to increase the overall efficiency of electric traction from about 19 per cent (a figure based on allowing 26 per cent for losses in transmission, distribution and traction motors) to about 24 per cent.

The improvement in power station efficiencies to which Mr. Fletcher refers will accrue from the C.E.A. policy of using larger generating sets, showing considerable gains in thermal efficiency, as reflected in the decision taken in 1956 to install single turbo-alternators of 120 MW. capacity in most cases where previously two sets of 60 MW. would have been employed. Actually, sets of 200 MW. are now being built for British power stations, while still higher ratings are being supplied for overseas and an output of no less than 550 MW. from a single set is expected to be announced shortly by a British manufacturer.

At the other end of the distribution system, Mr. Fletcher estimates that the availability of the electric locomotive allows of a reduction of 30 per cent in the number of units required. He quotes as an example the 288 miles which a locomotive on the Manchester-Sheffield electrification is able to cover in 24 hr., as against 100 miles by a steam locomotive; this results in a saving of £170,000 a year for the service by the reduction in train crews by 315 men. Referring to the efficiencies of 8 to 9 per cent which have been obtained with steam locomotives on test plant, the lecturer observes that this does not take into account wastage of coal during waiting periods, starting fires, running at uneconomical speeds and under other unfavourable conditions; and that the Ridley Report on national policy for the use of fuel and power resources could not give a closer figure than one within the range of 2 to 9 per cent, which was the best that could be expected with any fuel.

The Faraday Lecture will serve a valuable purpose in impressing its audiences with the potentialities of electric traction from the point of view of national economics, and with the consequent necessity of expending time in selecting and proving the most favourable system.

Locomotives for Indian 3,000-V. Electrification

English Electric 3,120-*h.p. design for Calcutta-Burdwan line*

English Electric 3,120-*h.p. Co-Co locomotive on passenger train at Sheoaophuli on the Howrah-Burdwan* 3,000-*V. electrification, Eastern Railway of India*

THE 3,000-V. d.c. electrification of the Howrah (Culcutta) to Burdwan section of the 5-ft. 6-in. gauge Eastern Railway of India was inaugurated on December 14. Editorial reference to this conversion and to the traffic problems in connection therewith is made on page 711. The Engish Electric Co. Ltd. has supplied 12, 111-ton 3,120 h.p. Co-Co locomotives. They are designated Class "EM/2" and designed for a maximum service speed of 70 m.p.h. They are the first 3,000-V. electric engines to be commissioned into service in India. In general they resemble the 3,000-h.p. class built by English Electric for the Santos-Jundiahy Railway in Brazil, for its 3,000-V. overhead electrification scheme.

Principal dimensions of the locomotive are:—

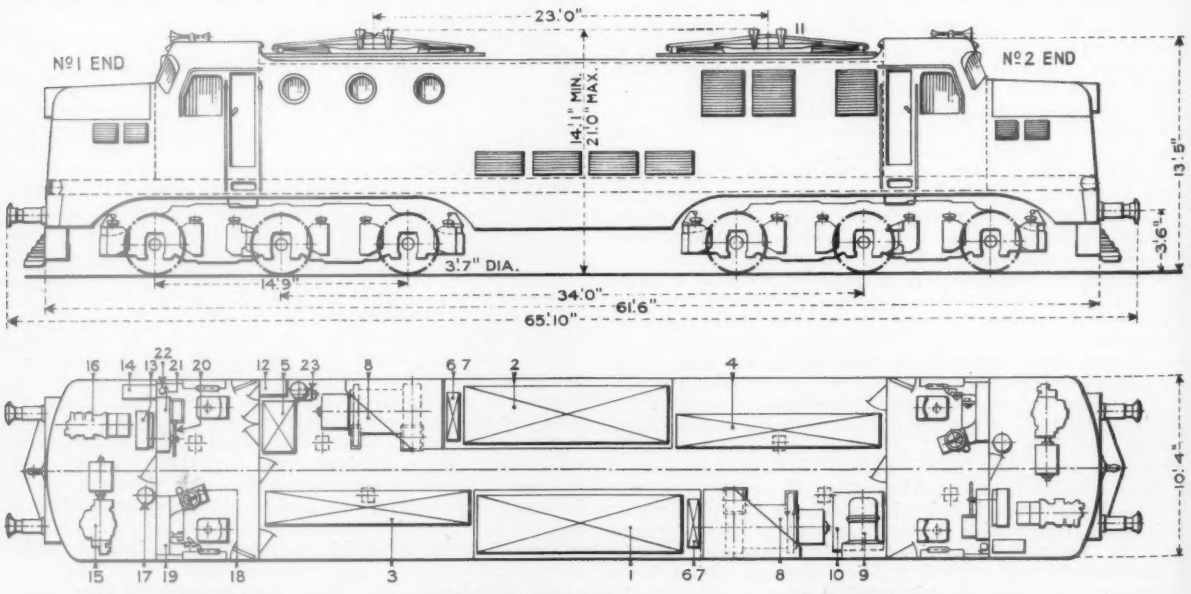
Gauge	5 ft. 6 in.	
Wheel arrangement	Co-Co	
Weight in working order	111 tons	
Axle load	18½ tons	
	ft.	in.
Length over buffers	65	10
Length over buffer beams	61	6
Width over handrails	10	7¾
Height over cab roof	13	5
Bogie wheelbase	14	9
Bogie pivot pitch	34	0

General Arrangement

The locomotive consists of a single superstructure. This is carried on two three-axle bogies in which each axle is driven through single reduction resilient spur gears by a nose-suspended axle-hung traction motor. The driving cab at each end of the superstructure is protected by a nose compartment. Access to each cab by a door on each side. Through communication is afforded by a central corridor. A compressor and exhauster are housed in each nose compartment, also their associated contactors and resistances; entry to the compartment is by a central door.

The driving position is on the left of the cab, where the master controller, brake handles and driving instruments are arranged within easy reach of the driver. The assistant's position is on the right, next to the hand-brake.

The high-tension control equipment is housed in two equipment frames



1. No. 1 main resistor frame
2. No. 2 main resistor frame
3. No. 1 H.T. equipment frame
4. No. 2 H.T. equipment frame
5. Low tension equipment frame
6. M.G. starting resistance
7. M.G. permanent resistance
8. M.G. set and traction motor blower
9. Pressurising fan and duct
10. Battery box
11. Pantograph
12. Clothes cupboard
13. L.T. contactor case
14. L.T. resistor case
15. Vacuum exhauster
16. Air compressor
17. Vacuum reservoir
18. Master controller
19. Instrument panel and desk
20. Handbrake
21. Desk and tool lockers
22. Fire extinguisher
23. Pantograph compressor, reservoir and cocks

General arrangement and layout of equipment of 3,000-*V., Co-Co electric locomotive, Eastern Railway of India*

mounted in the main body compartment, with the two main starting resistance frames and the two motor generator sets. Each high tension frame forms a compartment with bulkheads and the locomotive side and the access doors in the cab bulkheads are mechanically interlocked with the pantographs and main earthing switches.

The whole layout of the locomotive is designed to provide maximum accessibility for ease of maintenance and is symmetrical to give lateral and longitudinal balance. The latter aspect can be seen from the plan on page 712.

Underframe and Superstructure

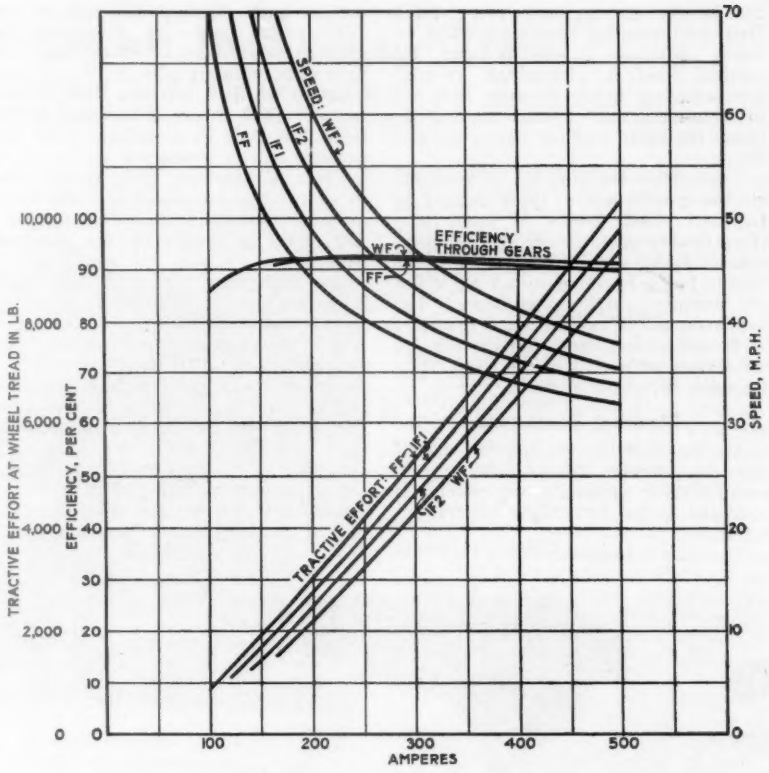
The underframe is fabricated from rolled-steel sections and plates; the main longitudinals run the full length of the locomotive. The robust buffer beams of rolled-steel plate are fitted with standard buffers, drawgear, and couplings. A standard design of cattle-guard is also fitted at each end.

The superstructure framing is constructed from rolled-steel and pressed sections. It is divided into sections to facilitate construction, each of which is assembled on jigs for welding. All joints are seam-welded and ground flush to provide a smooth and pleasing appearance. The roof over the main body compartment is sunk below normal roof level to house the pantograph, and is in two removable sections.

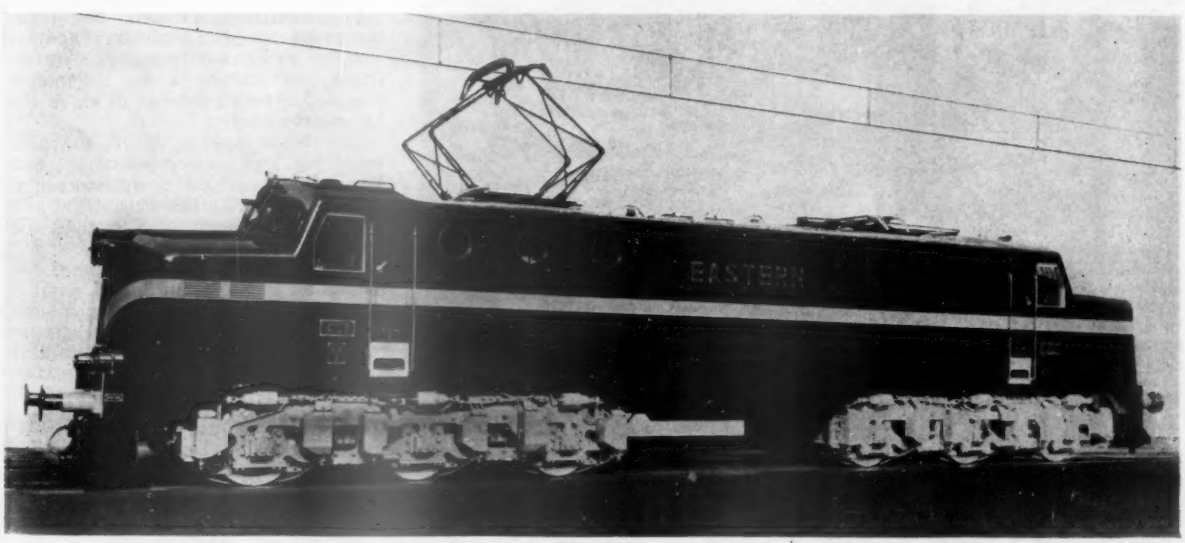
Special monsoon louvres are fitted in the sides to prevent ingress of rain water into filters. Partitions and bulkheads are constructed from steel sections and are panelled with steel sheet. The main floor plates are of steel welded to the underframe members and the assembly floor plates over the cable ducts are of steel chequered plate.

The underframe is carried on two slab frame bogies with swing link bolsters of a type previously used by the builders in Brazil, Spain and India. The basis of each bogie is two robust side frames of rolled steel plate, flame-cut and machined to profile, secured to fabricated steel transomes and headstocks by driving fit bolts.

The superstructure is carried through the centre pivot on to an annular bearing surface on the fabricated double bolster. The latter is supported on two fabricated spring plank assemblies through four groups of double elliptical leaf springs and the spring planks are suspended by long links from the transomes. Stops are provided on the side frames to limit the lateral movement of the bolster when under control of



Characteristics of traction motors; the gear ratio is 62 : 16



One of twelve 111-*ton*, 3,120-*h.p. Co-Co electric locomotives built by English Electric Co. Ltd.*

the bolster springs and swing links. Dual compensating beams are fitted between adjacent axleboxes and the vertical load is transmitted to each compensating beam through two sets of concentric coil springs located between the beam and the top of the side frame.

The wheels are built up from rolled-steel disc centres with tyres secured by riveting. Each wheel is fitted with clasp brakes operated through compensated rigging, each wheel set of brake blocks being operated by an air cylinder mounted on the side frame. The axleboxes are of cast steel and are fitted with roller bearings. There are 12 sandboxes on each bogie, six operating for each direction of travel.

Electrical Equipment

All the electrical equipment, except for the traction motors, pantographs and lightning protection equipment, is mounted in the locomotive superstructure.

The six force-ventilated traction motors each develop 520 h.p. at the 1-hr. rating and are insulated for the full line voltage. Three stages of field weakening are provided by a combination of field tap and divert resistances. Each motor is attached to the bogie transome by a resilient nose suspension and is supported on the axle by journal bearings. The characteristic of the traction motor at 1,450 V. to meet the operating requirements specified above is shown on the previous page.

The high-tension control equipment is mounted on two frames which form compartments with the locomotive sides. Access doors are provided in the rear bulkhead of each cab and the doors are interlocked with the pantographs and main earthing switches. The sub-division of equipment between the two frames is so arranged that when half of the traction power circuits is isolated, the equipment in one frame only controls the three motors on one bogie. Isolation switches are also provided to enable any one traction motor to be isolated with operation of the remaining motors up to the series full field connection. These isolating features are peculiar to Indian railway practice.

Two motor generator blower sets are provided. Each blower supplies cooling air to three traction motors on one bogie and air is tapped off the main duct to ventilate the high tension frame and nose compartments. Each generator supplies a compressor and exhauster and the remaining low-tension circuits—including the interior ventilating fan, low-tension control circuits, battery charging circuits and speedometer equipment—can be supplied from either generator through a low tension changeover switch.

The alkaline battery which supplies the control and lighting circuits is mounted in a ventilated container in the body of the locomotive immediately below the interior ventilating fan. The bulk of the low tension control equipment is located in a frame adjacent to No. 1 cab with access from hinged doors in the cab and body. A special feature of the low-tension equipment is the use of miniature circuit breakers instead of fuses.

Driver's position on left of cab, showing master controller, brake handles, warning lights and driving instruments

Pantographs

Two pneumatically-operated pantographs are mounted on the roof and connections are taken to isolating switches in one of the high-tension compartments. Each pantograph is connected to lightning protection equipment consisting of a lightning arrester and capacitor. The pantographs are of lightweight construction and embody double pans which are so balanced to enable the pans to follow irregularities in the overhead wire without movement of the main frame.

The main starting resistances are of expanded metal construction and are mounted in two separate resistance compartments, one adjacent to each high-tension compartment. The resistances are arranged for natural ventilation by air drawn through the underframe and louvres in the locomotive side and expelled through cowls in the locomotive roof.

The brake system is of the air/vacuum type, incorporating two Westinghouse DVC3 compressors and two Northey 180 RE exhausters; the locomotive is fitted with straight air brakes.

The power circuits are arranged for the series, series parallel, and parallel connections of the six traction motors with shunt transition between groupings. These connections are controlled through a hand wheel type of master controller.

Principal sub-contractors include:—

Brake gear	..	Westinghouse Brake & Signal Co. Ltd.
Exhausters	..	Northey Rotary Compressors Limited
Lightning arrester		E.M.P. Electric Limited
Lightning arrester condenser		British Insulated Callender's Cables Limited
Headlamps	..	J. Stone & Co. (Deptford) Ltd.
Batteries	..	Nife Batteries Limited
Axleboxes	..	British Timken Limited

Amsterdam-Brussels Dual-Voltage Trains

Multiple-unit sets for inter-running between 1,500-V. and 3,000-V. systems

Dual-voltage multiple-unit stock built by Werkspoor with electrical equipment by A.C.E.C. and S.E.M., for Amsterdam-Brussels services

TWELVE two-coach multiple-unit sets designed for operation on 1,500 V. or 3,000 V. d.c. began working through services between Amsterdam and Brussels on October 1. This rolling stock, described in the article in our August 30 issue by Mr. J. E. J. Ankersmit, of the Netherlands Railways, has been provided jointly by the Netherlands Railways and the Belgian National Railways, which own eight and four of the sets respectively. It is used on regular-interval inter-city services supplementary to the locomotive-hauled international trains; these services have been electrically operated between Amsterdam and Brussels since the introduction of the 1957 summer service, and perform the Brussels-Amsterdam journey in 3 hr. 18 min.

The mechanical parts of the multiple-unit sets have been built by Werkspoor, Amsterdam, while the electrical equipment has been supplied from Belgium by the Ateliers de Constructions Electriques de Charleroi and the Société Electro-Mécanique of Ghent. Apart from the special drum switch for selecting operation on 1,500 V. or 3,000 V., the control equipment is similar to that supplied by A.C.E.C. for 176 motor coaches and 136 locomotives in service on the S.N.C.B., comprising the Jeumont-Heidmann motor-driven camshaft for operating all contactors except the line switches.

Traction Motors

The traction motors are similar to those built by A.C.E.C. and S.E.M. for 139 motor coaches of the Belgian National Railways. On either line voltage they operate with 1,500 V. across the brushes and are rated for one hour at 243 h.p., 1,440 r.p.m., or continuously at 204 h.p., 1,565 r.p.m. Weight of a motor and gears is approximately 2 tons 7 cwt. The machines are axle-hung and nose-suspended; the nose-suspension is effected by a sprung mounting on the bogie transom. To meet Netherlands Railways requirements, special brushes in contact with the driving axles carry the traction return current and obviate the flow of current through the roller bearings in the axleboxes. Similarly, one step of field-shunting with the motors in series, which is not normal in Belgian practice, has been provided because Netherlands Railways motormen are accustomed to this facility for maintaining a small tractive effort at moderate speeds.

As stated in our August 30 issue, Belgian National Railways 3,000-V. d.c. locomotives run into and out of Rosendaal Station at 1,500 V. Reduced speed at this voltage is accepted because of the short distance involved, and the only modification necessary in the locomotives engaged on this duty has been to make automatic provision for holding in the voltage relay when operating on 1,500 V., as with the normal adjustment for 3,000-V. operation, this relay would drop out at voltages below 2,000.

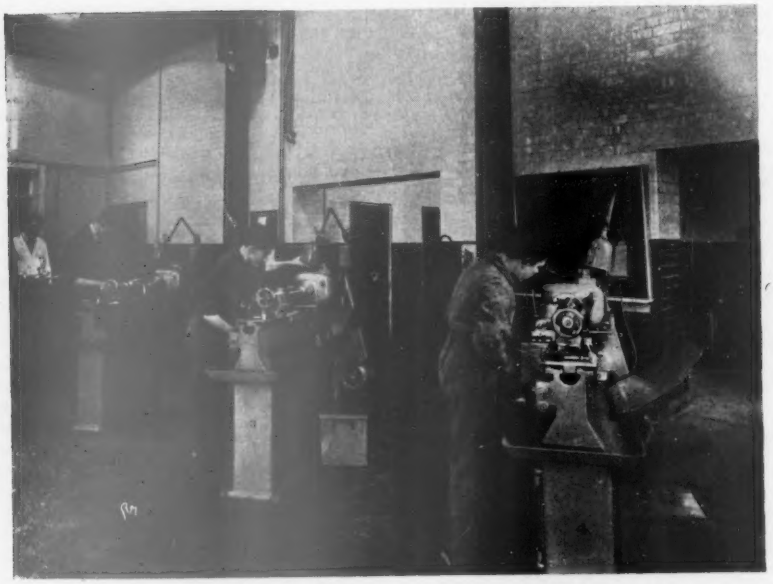
RAILWAY RESEARCH FACILITIES IN POLAND.—The Polish Railway Research Institute, which consists of nine establishments working in such fields as electric traction, safety, and economics, has announced its programme of work for the coming 12 months. An important feature of the research plans of the Safety Section is experimental work on A.T.C. The Permanent Way Section is experimenting with pre-stressed concrete for bridges and sleepers (because of the need to economise in timber). Experiments are also being made with welded rail joints, and there are at present several miles of track with welded joints under testing. Ultrasonic defectoscopes for detecting faults in rails is among the subjects of research of the Technological Section. The Chemical Section is conducting work on oils and lubricants, anti-corrosive agents, and the use of synthetic materials for covering carriage roofs. The Economics Section is studying the relative financial advantages of electric and diesel locomotives, and the economics of road and rail transport of "smalls." The Institute plans to build in 1958 a new dynamic research laboratory at Olszyna Grochowska.

SOUTHERN PACIFIC PROPOSES ZONE FARES.—The Southern Pacific Railroad proposal to change its fare system in the San Francisco Peninsula from individual to zone fares, which would reduce the 1,600 different fares now in operation to 164, has been agreed by the California Public Utilities Commission after several months' consideration. In case the proposal should not be agreed, the S.P. put forward an alternative plan for a percentage increase in all existing fares, but the zone plan was preferred. This provides for an average increase of 8 per cent in fares, and has had no serious opposition from the "commuting" public. The railway estimates an increased revenue of $310,000 annually from the rise, and an economy of $200,000 from the zoning, so that its annual loss on operation should be cut from the present $800,000 to $290,000. The Commission has taken a more favourable view of the application than it might otherwise have done as a result of the substitution by the railway of new two-level gallery type coaches and diesel locomotives for the previous steam-hauled trains.

NEW SCOTTISH REGION FREIGHT SERVICE.—The Scottish Region of British Railways has introduced a new express freight train leaving Niddrie West, Edinburgh, in the early hours of the morning for Wolverhampton where connecting services take the traffic forward to the West of England and South Wales. The train runs daily, Mondays excepted, and has been designed specially to meet the needs of traffic from Aberdeen, Dundee, and Burntisland conveyed by fast feeder services to Niddrie. It also provides an additional high speed service for Edinburgh traders.

Apprentice Training School at St. Pancras

Existing building adapted to provide facilities in London



Turning section of London Midland Region Apprentice School at St. Pancras

THE London Midland Region has established an Apprentice Training School at St. Pancras, London, to serve the needs of the various engineering departments of the Region in the London area. As reported in our issue of October 25, it was officially opened by the General Manager of the Region, Mr. David Blee, on October 17.

The five departments covered by the Training School are Civil, Mechanical and Electrical, Motive Power, Road Motor, and Signal. The training school has accommodation for 36 apprentices and the period of training is one year. Intakes are, however, made three times each year to coincide with normal school-leaving arrangements at the end of each term.

The school which has been adapted from an existing building, has a fitting and turning section, an electrical and woodworking section, as well as classroom and other facilities.

The training course is divided roughly into two-thirds practical training and one third theoretical. The curriculum of the latter includes: workshop mathematics, workshop science, workshop theory, free-hand sketching and engineering drawing, industrial history and industrial geography.

First aid and physical education are also taken in the training school. Practical training is of a dual nature, covering both basic mechanical and electrical engineering, in view of the increasing importance of diesel-electric traction. The practical instruction is arranged to cover fitting and turning, and electrical work.

Length of Training

The first four months in the school are probationary. During this period the apprentice trainee is given two months instruction on each section of the workshop, and at the end of the four months the chief instructor is in a position to decide the trade for which he is most suited, bearing in mind his stated preference and the requirements of the department to which he will be eventually attached. For the remaining eight months, four months is spent on each section, which will ensure that all trainees have a basic understanding of fitting and turning, and electrical work.

As with other apprentice schools in the Region, besides trade training, the curriculum is also planned for education in the broadest sense, and every encouragement is given to enable the trainees to develop into useful citizens. Such means as educational and instructional films, talks on general railway subjects, current affairs, the Factories Acts, visits to works, and so on, are included in the course.

Similar schools are already in operation at the Crewe and Derby Locomotive Works, and at the Derby, Earlestown and Wolverton Carriage & Wagon Works of the Region; also work has been started on a completely new training school at Horwich Locomotive Works which, it is anticipated, will be completed in August, 1958. References to the foundation stone laying ceremony of the school at Horwich were made in our issues of November 8 and 15.

INTERCONTINENTAL TRANSPORT CLUB, PARIS.—The Club Intercontinental des Transports, 11, Rue de Milan, Paris 9e, which includes many railway officers in its membership of 1,000, will attain in 1958 the tenth year of its existence. The club has arranged to celebrate the New Year with a dinner dance, including a tombola and other attractions, commencing at 10.30 p.m. on December 31. The price of tickets is 1,950 francs a person. Applications should be addressed to the Secretary.

FILM ON DENSIFIED WOOD LAMINATE.—Some 80 guests attended the premiere showing of "The Hydulignum Story" at the British Council Film Theatre in London recently. This film describes the manufacture of Hydulignum densified wood laminates and its various applications for press tools, aircraft propeller blades and many other purposes. Showings are being arranged for several major centres at home and overseas. The film was produced by Hordern Richmond Limited, a member of the Permali Group of companies, which specialises in the production of densified wood laminates for industry.

PADESWOOD & BUCKLEY STATION TO CLOSE.—British Railways, London Midland Region, announce that Padeswood & Buckley Station, between Chester and Mold, is to be closed from January 6, 1958. Passengers should book to Llong or Hope and Penyffordd according to direction of travel, where local bus services are operated. Parcels and passenger train merchandise will be dealt with at Mold.

YORK RAILWAY MUSEUM.—The Small Exhibits Section of the York Railway Museum has been closed until Easter whilst a complete reorganisation of the exhibits is carried out. The collection of prints of historical railway interest is to be framed in contemporary style. Black mounts and frames without moulding are to be used, effectively bringing out the detail in the prints. Additional exhibits, particularly models, are to be added to the collection, which is to be re-positioned to follow a more logical sequence enabling visitors to appreciate more easily the development and history of the railway system in the North Eastern Region. After similar reorganisation of the Large Exhibits Section, the number of visitors increased considerably. This year, to-date, the figure is more than 130,000, the highest recorded.

ROAD CASUALTIES IN OCTOBER, 1957.—During October, 537 people were killed on the roads of Great Britain compared with 424 in the same month of 1956. The number of persons seriously injured was 5,624, a decrease of eight, and the number slightly injured 17,396, a decrease of 541, making a total for all casualties of 23,557. This was 436 less than in October, 1956.

RAILWAY NEWS SECTION

PERSONAL

H.M. King Baudouin of Belgium has conferred on Mr. C. K. Bird, General Manager, Eastern Region, British Railways, the decoration of Chevalier de l'Ordre de Leopold.

M. Louis Armand, President, Société Nationale des Chemins de Fer Français, who, as recently recorded, has been invested with an honorary K.B.E., was born at Cruseilles (Haute Savoie) in 1905. He began his transport career with the Paris Lyons & Mediterranean Railway in 1934, and held a variety of executive positions which afforded him a thorough knowledge of the organisation and methods of working of the railway industry. Editorial reference is made this week to his patriotic service during the last war and to some of the research he has carried out for the S.N.C.F., of which he became Assistant Director-General in 1946 and Director-General in 1949. In accordance with the findings of various commissions of inquiry he reorganised French transport and was thus a prime mover in the postwar policy of the S.N.C.F. to increase traffic while diminishing the number of vehicles and locomotives in use and reducing personnel by more than 90,000 in six years. He is Chairman of the International Union of Railways (U.I.C.), a member of the governing body of the Ecole Nationale d'Administration, a lecturer at that Institution, and a member of the committee for educational reform. At the request of the French Government he has undertaken an inquiry into the problem of power supply in Europe and is a member of the committee of inquiry into the problem of obstacles to free monetary exchange. He is Chairman of the Bureau d'Organisation des Ensembles Industriels Africains, a body set up by the Government in 1953 to study the development of desert territory in the French Union. He is also a Member of the Conseil Scientifique du Commissariat a l'Energie Atomique and Chairman of its industrial equipment committee, a Member of the Conseil Supérieur de la Recherche Scientifique et du Progres Technique. He holds the rank of a Commander of the Legion of Honour and is a Compagnon de la Liberation.

M. Louis Armand
President of the S.N.C.F. and now an Honorary K.B.E.

Mr. J. Kater
Chief Engineer, Netherlands Railways & Chairman, B.13 Experts Committee, U.I.C., who has retired

Mr. S. G. Hearn, at present Chief Operating Superintendent, Western Region, British Railways, has been appointed Assistant General Manager (Traffic), Eastern Region. He will take up his new position on January 1.

Mr. Kenneth McGregor, an Under-Secretary in the Industries & Manufacture Department of the Board of Trade, has been appointed United Kingdom Senior Trade Commissioner & Economic Adviser to the High Commissioner in Canada. He succeeds Mr. Gordon Bowen, who returns to headquarters on completion of his tour of duty. Mr. McGregor, who has been responsible for co-ordinating the arrangements for the Canadian Trade Mission to the U.K. and is accompanying them during their visit, will take up duty at Ottawa in the summer of 1958.

Mr. Jan Kater, Chief Engineer, Netherlands Railways, and Chairman of the B.13 Experts Committee of the U.I.C. until May 1 this year, has retired after some 36 years of railway service. Mr. Kater was born at Medemblik, Holland, in 1894 and educated at the Technical University at Delft. He began his railway career at Haarlem in the Rolling Stock Repair Workshops in April, 1921, and, after successive promotions, became Chief Engineer of the Motive Power & Rolling Stock Department in April, 1942. In October, 1951, he was appointed Chairman of the B.13 Experts Committee by the Control Committee of the Office for Research & Experiments (O.R.E.) of the International Union of Railways (U.I.C.). This Committee was entrusted with the study of diesel traction and later on with the standardisation of diesel locomotives. A report on the results obtained for four classes of Diesel locomotives was issued.

Mr. R. A. Allington, Engineering Assistant, Group "C," Chief Civil Engineer's Office (Steelwork Section), Paddington, Western Region, British Railways, has beeu elected an Associate Member of the Institution of Structural Engineers.

Mr. E. E. Sayers

Appointed General Agent, Belfast, Canadian Pacific Railway

Mr. E. E. Sayers, Passenger Agent, Liverpool, Canadian Pacific Railway, who, as recorded in our December 6 issue, has been appointed General Agent at Belfast, joined the C.P.R. in 1924 as a passenger clerk in the then headquarters at Trafalgar Square in London. He became Assistant to the General Passenger Agent in London in 1951, and was promoted to be Passenger Agent, Liverpool, in 1955.

We regret to record the death, at the age of 67, of Mr. E. Rawdon Smith, O.B.E., Public Relations Officer, London Passenger Transport Board, from 1935 to 1939. Mr. Rawdon Smith was educated at St. Edward's School, Oxford, the Sorbonne, Paris, and Queen's College, Oxford, where he took an Honours Degree in Law. Called to the Bar in 1912, he was attached until 1914 to the Northern Circuit. On the outbreak of war he was commissioned ini the Rifle Brigade, served in France in 1915, and was invalided home the same yeai. In 1917 he joined the Recruiting Department of the War Office and, on its formation, the Ministry of National Service. Later, he was appointed Assistant Secretary of the Ministry of National Service, Secretary to the Council of the Ministry, and Secretary of the Labour Supply Sub-Committee of the War Cabinet. In 1918 his exceptional administrative qualities gained for him the O.B.E. Back in civil life, he became Secretary of George Spencer Moulton & Co. Ltd., and of its associated companies in 1919. He remained with the organisation until 1926 when he went to Australia to supervise the affairs of A.E.C. (Australia) Proprietary Limited. In 1927 he was appointed Secretary & Treasurer of the Associated Equipment and Associated Daimler companies. A year later he became Assistant Secretary of the Underground Electric Railways group and its subsidiary companies. For a time he also held the appointment of Staff Officer to the same companies. When, in 1933, the London Passenger Transport Board was formed, Mr. Rawdon Smith was appointed Assistant Secretary to the board, and, in 1935, he became Public Relations Officer, the position he held until 1939, when he left London Transport to become Public Relations Officer for Imperial Airways Limited. From 1949 onwards he served the English Electric Co. Ltd. in a similar capacity, retiring from active responsibility in 1955.

On pages 465 and 490 of our October 25 issue we referred in some detail to the proposed development of North-East Nigeria. Reference was also made to the possibility of obtaining a loan from the International Bank for Reconstruction & Development. The accompanying photograph shows members of a technical mission from the International Bank which visited Nigeria in October to investigate an application made by the Nigerian Railway Corporation for aid toward the cost of constructing a 400-mile extension from the existing railway to Maiduguri in North Eastern Nigeria. The Mission is shown with Colonel Sir Ralf Emerson, Chairman & General Manager, and Members of the Nigerian Railway Corporation.

Mr. Cyril A. Pegg

Appointed Passenger Agent, London City Office, C.P.R.

Mr. Cyril A. Pegg, who, as recorded in our December 6 issue, has been appointed Passenger Agent, London City Office, Canadian Pacific Railway, joined the C.P.R. in 1919, in the City Office. Later he moved to the Trafalgar Square Office, then the company's headquarters. During the last war he was commissioned in the Royal Engineers (Movement Control) and served overseas. He returned to the C.P.R. in September, 1946, rejoining the passenger department in the West End.

Colonel Sir Ralf Emerson, Chairman & General Manager, Nigerian Railway Corporation (standing, centre) with members of a technical mission from the International Bank (see paragraph above)

Antofagasta (Chili) & Bolivia Railway

Mr. H. C. Drayton's review

The sixty-ninth annual general meeting of The Antofagasta (Chili) & Bolivia Railway Co. Ltd. was held on December 11 in London, Mr. H. C. Drayton, Chairman, presiding.

The following is an extract from his circulated statement for the year 1956:—

The net receipts from the operation of our railway, moles and waterworks in 1956 were £559,021, a reduction of £123,781 compared with 1955.

The Board recommend the payment on December 12, 1957, of a dividend of 4 per cent. (less income tax) on the consolidated ordinary stock, in respect of the year 1956. This will leave a credit balance on net revenue account as at December 31, 1956, of £823,467, which it is proposed to carry forward to the year 1957. This is £27,148 more than the amount carried forward in 1955, which I then explained by the uncertainties of the year 1956. That year, as I anticipated, certainly proved difficult; and our forebodings have unfortunately been substantiated in 1957, for during the current year we have, for some months past, been operating at a loss in Bolivia. In these circumstances, you will, I am sure, see the necessity for a large carry-forward.

In addition to the £169,241 charged in working expenses for renewals, we have provided a further £100,000 for the Antofagasta Company system and £20,000 for the leased lines of the Bolivia Railway Company. The loss of £13,713 on operating the Aguas Blancas Railway was £2,364 greater than in 1935.

O.T.C. Status

The Chairman, addressing the meeting, said:—"I said in my published Statement that the provisions of the Finance Act, 1957, relating to Overseas Trading Corporations, may be of some benefit to this Company. I know your interest in this matter. Briefly, our U.K. tax position is now as follows. We still have a few months in which to decide whether or not to claim O.T.C. status. We cannot, however, just opt in and out as it suits us from one year to another. We therefore have to consider not only our 1956 Accounts. There are also many factors which have to be taken into account, such as the amount of our profits—and these we know have fallen in 1957: the amount of income tax which we pay overseas—this affects the amount of our unilateral relief.

Other factors are the capital allowances position, the amounts distributed to stockholders, and so on. But with respect to 1956, although we have provided in those accounts for U.K. tax on the basis of a non-O.T.C., we do anticipate that we shall qualify as an Overseas Trading Corporation, when the proper time comes, in which event we calculate that some £150,000 out of the 1956 tax provision would become free. This means we shall propably opt to be an Overseas Trading Corporation, but the benefit to be derived could in certain circumstances be illusory.

Traffic Prospects

I have already given indications of the fall-off in traffic and I regret that I do not at the present time have encouraging news. You will have seen the very considerable decreases that have taken place in the price of minerals, and especially those which compose a large proportion of our traffics, i.e. copper, tin and zinc. None of the producers has been able to give us, as they usually do, an estimate of the probable total shipments expected during the ensuing year. In fact, you may have seen in the Press that question of cuts in output of these minerals is being discussed. It should also be remembered that a decrease in the price of minerals, apart from the quantity produced, has far-reaching economic effects on the producing countries which react on our other traffics such as passengers, import and local goods.

The report and accounts were adopted.

SALVADOR RAILWAY COSTS.—An application by the Salvador Railway for an increase in railway rates to meet higher costs, especially of oil fuel, has been unsuccessful. The company is renewing its efforts to obtain such authorisation and has been assisted by the Government of El Salvador, as an emergency measure, to obtain loans of some £28,000 to settle local debts. The 3-ft. gauge railway has 102 miles of track.

FESTINIOG RAILWAY SOCIETY ANNUAL MEETING.—The annual general meeting of the Festiniog Railway Society Limited will be held at Portmadoc on April 26, 1958, and in this connection a special train will run from Paddington, calling at Birmingham, Wolverhampton, Shrewsbury, and so on. It is hoped that members and friends will have the opportunity of travelling on the Festiniog Railway as far as Tan-y-Bwlch, and that the double engine *Taliesin* will haul the train. The Society has prepared a set of lantern slides on the railway, many of which are historical scenes taken from G. F. Spooner's album of 1880-90. Representatives will be pleased to address clubs and societies, using the slides as illustration of the "rise, fall, and rebirth of a railway." Inquiries for the loan of the collection should be addressed to the Publicity Officer, 129, Cannonbury Avenue, Pinner, Middx, or at 27, Farquhar Road, Edgbaston, Birmingham.

Kent Coast Electrification Scheme

"Mechanical men" on the up line at Sittingbourne Western Junction lifting a 300-ft. 150-lb. conductor rail

Lifting gear straddling a rail of the up line and lowering the conductor rail on to the insulators

NEW EQUIPMENT AND PROCESSES

Tolerance Rings for Shafts and Housings

STAR tolerance rings are resilient construction elements made from special spring steel strip, which are interposed between machined parts which are required to be an interference fit.

The use of these components provides an interference fit with wider limits on both mating parts; allows a given amount of torque to be transmitted; compensation for heat or work expansions, as well as for variations in machining tolerances and automatic adjustment for a degree of misalignment.

The great accuracy usually required on housings and shafts, for example, for ball and roller bearings, is reduced, and the capacity to transmit considerable torque further cheapens an assembly by eliminating splines, keyways, pins, and so on.

They can also be used in more simple applications such as the fitment of hand wheels and lever knobs, which are normally fitted by screw threads. The cutting of screw threads is eliminated, and the components securely held by the press fit afforded by the ring.

Another advantage claimed for tolerance rings is the ability to take up differential linear coefficients of expansion of two different metals, as in the case of a ball bearing fitted to a light alloy housing. This can be a problem where, due to the effect of heat, the outer race becomes loose in its housing, resulting in "creep." This can sometimes cause damage to the bearings after a relatively short service life.

As can be seen from the accompanying illustration, tolerance rings consist of a spring steel strip containing a number of corrugations. Each corrugation acts as a spring and when compressed between two parts, exerts a constant load dependent on the degree of compression.

The radial space between the mating metal components into which the ring is to be fitted is so determined as to compress the corrugations with the result that a pre-determined degree of torque can be transmitted. To transmit greater or lesser torque is simply a matter of adjusting the width of the ring. The manufacturer is in a position to advise users on the correct fitment of the units.

Star tolerance rings have been used on the Continent for many years, in most branches of engineering, and are now available in this country from George Angus and Co. Ltd., Oil Seal Division, Coast Road, Wallsend-on-Tyne, to which enquiries should be addressed.

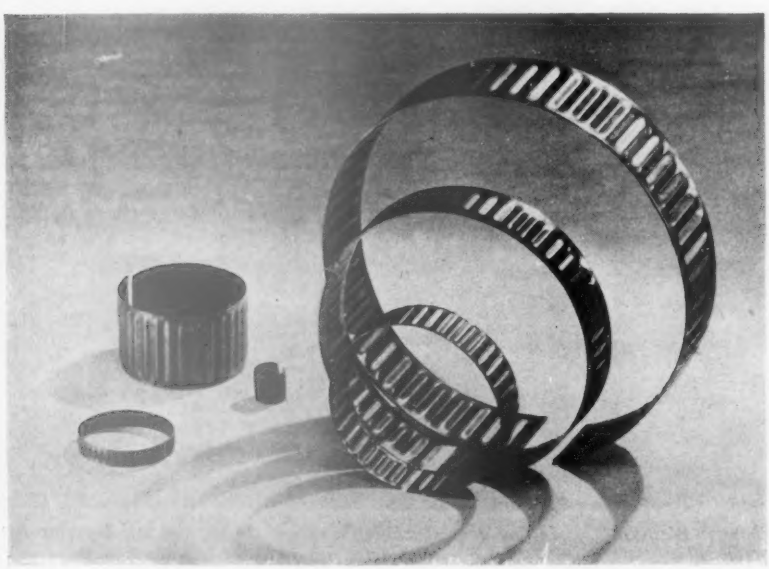
Grip Ring Fastener

THE Salter grip ring No. 5555, has been introduced by the manufacturer as an addition to its extensive range of Truarc shaft fasteners.

A feature of No. 5555 ring is that it requires no groove. It is held in any desired position on the shaft by virtue of its complete periphery around the shaft and its unusually large radial width, which combine to give the ring a considerable hold against axial displacement. Its main function is to provide, on a shaft, a positioning shoulder which is secure against moderate thrust and vibration, and for this purpose, it is stated, it can replace, for instance, the costly collar and set screw.

It is normally manufactured from carbon spring steel which is then chemically blacked and oil dipped, but alternative materials and finishes are available. The tensile strength of the fastener, obtained by careful heat treatment, is between 238,000 and 280,000 lb. per sq. in., the danger of permanent set being thus eliminated.

The No. 5555 fastener, which is manufactured by Geo. Salter of West Bromwich, is being distributed in this country only through G. C. Hale & Company, 4, North End Road, Golders Green, London, N.W.11.



Compact Rail Grinding Machine

A RAILHEAD grinding machine, which is driven by a fan-cooled petrol-engine, is now available in this country. This is the Robel 33. Designed for grinding welded rail joints and superimposed welds on flat-bottom rails in situ, including the running surfaces, sides and contours of the railhead.

Features of the machine include a built-in feeler device which indicates, accurately, the height of material which remains to be ground, and the ability to see the area being ground. These obviate the need to remove the machine to check the grinding area with a ruler, and also ensure that unintentional grinding of a cavity is avoided.

The machine is light but strongly built, and is capable of being operated and lifted by one man. The distance between the running rollers is large, allowing, it is claimed, long, level grinding.

The single-cylinder, two-stroke engine of 5·5-h.p. is equipped with a fuel tank and silencer, and is fitted with a returning rope-starter. It is provided with a carburettor which operates over the whole tilting range of the machine. It drives the grinding shaft by a bevel gear running in an oil bath.

The adjusting device for the grinding shaft is operated by a hand-wheel which also serves as a hand-grip for the machine. All parts are provided with compensation for play. The frame is of light metal. The centre carries the engine and grinding units and also the cranked bar by which the machine can be inclined and guided. At each end is mounted a running roller. This has a hardened surface and is fitted with roller bearings.

The Robel 33 is also fitted with an auxiliary power take-off allowing a flexible shaft to be fitted for driving, for example, a hand-grinder for preliminary grinding work, or for grinding point frogs, and so on.

Leading dimensions of the machine are: length, 50¼ in.; width, 20⅞ in.; height, 29½ in.; running wheel centres, 39⅜ in.; weight, 115 lb.

Further details can be obtained from

the distributor, in this country, Feska Industrial Equipments Limited, 27, Percy Street, London, W.1.

Conveyor Belting

A TYPE of conveyor belting based on Terylene, known by the trade name Rilflex, has been developed, and has received a full approval by the National Coal Board. An advantage claimed for the product is that it is lighter in weight while possessing the same physical properties as the standard types of multi-ply belting based upon cotton duck. It is stated that, for example, a Rilflex belting of three plys had a strength equal to a cotton belt with twice the number of plys.

Because Rilflex is thinner than other belts, there is less strain in moving round the pulleys and smaller diameter pulleys may be used. It behaves better than standard belting under conditions of low temperature, where standard types of belt have delaminated, and there is an improved coefficient to friction.

The belting is fully anti-static and fire-resistant and the full Terylene warp, it is claimed, enables it to withstand shock loads which would break a cotton belt. The carcass is unaffected by water, oils, acid or alkali and is completely rot proof.

Further details of Rilflex conveyor belting can be obtained from Rubber Improvement Limited, 27, Fitzroy Street, London, W.1.

Standard Steel-Frame Buildings

THE manufacturer of standard steel-framed buildings is extending its range, as a result of a recent market survey.

The company can now supply steel-framed buildings for low-cost housing and estate projects, saw-tooth industrial buildings, and special buildings for both heavy and light industrial purposes, workshops, and so on, at prices which it is claimed are in most cases one-third lower than those charged for purpose-made structures. Although the buildings are produced from standard components permitting immediate deliveries, they can be erected in various combinations of sizes and spans to satisfy any particular requirement.

The range now covers the requirements of the main climatic zones of the world; the tied portal frame design permits the utmost economy in materials and requires only semi-skilled labour for erection. The illustration shows a typical building design of the range.

The special design of steel-framed building conforms to the 40-lb. loading requirements of the Scandinavian and Canadian markets. The temperate building meets loading requirements under B.S.S. 449; and the special tropical standard building with veranda attachments, overhanging eaves and under-eaves ventilation has been designed to meet hurricane loadings.

Particular regard has been paid to the fact that in some areas heavy rainfall brings all work to a standstill and the buildings are so constructed that the roof and supporting stanchions may be erected in the first place permitting walling and interior work to be carried out under cover without interruption.

An especially low cost design has been produced where purchasers propose to erect their own frontage from local materials such as stone, brick or concrete.

The manufacturer, Sanders & Forster Limited, 3, Buckingham Palace Gardens, London, S.W.1, will supply further details of these types of structures on application.

Level Controller for Containers

A LEVEL CONTROLLER designed to show whether a container is full or empty, between prescribed levels, can be used with tanks and similar vessels used for liquid, powder, or granular substances.

The equipment comprises an indicator unit and one or two probes, as required, which are inserted into the tank or container. The electrical capacity between the probe elements and the container is altered by any substance in close proximity to the probe, and thus actuates the indicator at the probe levels.

Two types of probe are available to cover most applications. The type C is a "stick" probe which consists of a box 4½ in. × 4½ in. × 3 in. deep, with a 2-in. dia. insulated cylinder projecting from the centre of one face. The unit weighs 3½ lb.

A 2-in. dia. hole is cut into the tank to accommodate the probe, and it is positioned with its end face flush with the inside of the container. Packing pieces or gaskets are used if needed to achieve correct positioning. From this face a 1½-in. long, 14 s.w.g. stainless steel wire projects into the container and forms the actuating element. This type is particularly suitable for powders.

The second type of probe, type F, is similar in size and fitting with the first version, except that the stainless steel wire element is omitted, thus leaving a flush surface inside the tank. This probe is suitable for most liquids, granular substances and powders which do not leave any deposit on the tank wall of more than 1-mm.

The indicator unit is housed in a cast aluminium box measuring 6½ in. × 9¾ in. × 6½ in. deep with two indicator lights fitted on the front panel; it weighs 10½ lb. Provision is made for make or break circuits of 250 V., 5 A., on each level indicator relay.

The unit, with two probes, may be used as two independent level controllers, or may be arranged to control high and low levels in the same container.

It is also available as a single level controller and timer. This "probe-timer" is for use with a tank of emptying time not greater than 45 sec.

Connections between indicator and probe are made in twin co-axial cable and may be of any length up to 300 ft. The instrument operates on any supply voltage from 200-250 V., 50 c/s.; power consumption is 20 W.

The unit is being manufactured by Goring Kerr Limited, Station Road, Gerrards Cross, Bucks.

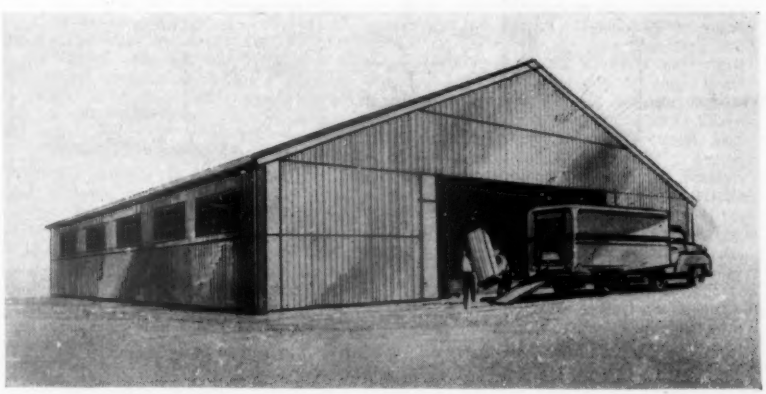
Rigid Synthetic Foams

RIGID foams with good strength/weight ratios can be produced by the action of recently introduced isocyanates, Suprasec D and Daltolac 21, with certain polymeric reactants.

Of application for thermal and sound insulation, anti-condensation coatings, and so on, they have the advantage of the ability to be made on the spot where required, obviating the need for transporting pre-formed blocks. They can be formed in situ, even in awkwardly shaped or barely accessible cavities, and should find use in refrigerator walls, and so on.

They have a firm adherence to metal or other surfaces which allows them to form an integral part of the assembly. In some cases, the added strength makes lighter metalwork frames possible.

Suprasec D and Daltolac 21 are manufactured by Imperial Chemical Industries Limited, Millbank, London, S.W.1.



Ministry of Transport Accident Report

Chapel-en-le-Frith South, February 9, 1957 :
British Railways, London Midland Region

Brigadier C. A. Langley, Inspecting Officer of Railways, Ministry of Transport & Civil Aviation, inquired into the accident which occurred at about 11.21 a.m. on February 9, 1957, at Chapel-en-le-Frith South, when the 11.5 a.m. down freight train, Buxton to Arpley, consisting of 33 wagons, 24 loaded with coal, and 20-ton van drawn by "8F" class 2-8-0 engine No. 48188, got out of control, in consequence of a failure of a joint in the steam brake piping rendering that brake useless, on a steep incline after the point where the driver would have stopped to pin down brakes and, gathering speed, overtook violently the 8.45 a.m. freight train, Rowsley to Edgeley, consisting of 37 wagons and van, drawn by a similar engine, as it was passing Chapel-en-le-Frith at about 20 m.p.h.

Much damage was done and the piled-up wagons formed a mass of debris 25 ft. high, blocking both lines. The 10.20 a.m. two-coach up diesel train, Manchester London Road to Buxton, was in the station and struck by the derailed engine, but most passengers had already been detrained and none was injured. The driver of the colliding train, by then alone on the footplate, was killed. The signalbox was demolished and block and telephone communication severed, but fortunately the latter remained available from the station-master's office whence assistance was summoned and arrived without delay. Traffic through the station could not be restored until the morning of February 12. Weather was fine and rails dry.

Brake Power

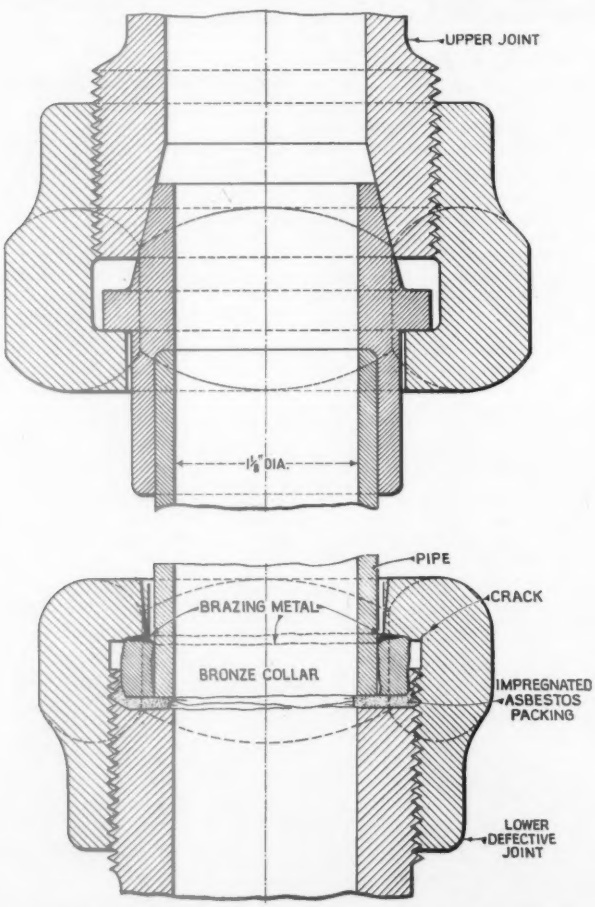
The engine and tender steam brake should have given 77 tons brake power, or 10 per cent of the total weight of the complete train, and combined with the guard's hand brake, 93 tons. With 16 wagons also braked this figure would have risen to 164, or 21 per cent, but tender and guard's hand brakes alone—all that in fact were operative—gave only 24 tons, or 3 per cent of the entire train. Normally such trains stop to pin brakes down at Bibbingtons Siding, some three miles to the south of the scene of the accident, where there is a loop with a clear length of about ½ mile, but the failure of the pipe and discharge of steam prevented that from being effected and the train ran through there and out down the main line.

There was no conflict of evidence regarding the course of events and although a number of witnesses were heard it will suffice here to give the essential facts emerging from their statements. The signalman at Dove Holes, who controls the outlet from the loop above mentioned, saw steam pouring from the engine of the train from Buxton and the driver making signs as if wanting the points set for leaving the loop. (The signalman was intending to hold it to give a passenger train precedence.) Seeing it could not stop he decided, although the train from Rowsley was still in section, to let this one follow as the best thing he could do; when it passed at what he thought a high speed he telephoned the facts to Chapel-en-le-Frith. There the signalman told the guard of the diesel train, come to the box in obedience to Rule 55, to warn his passengers and a driver travelling as one in that train, who realised from the steam pouring out of a tunnel not far south that something must be following the one from Rowsley, then coming, also helped and with his guard and other staff made signs to the approaching driver to accelerate, but without avail.

The principal evidence came from the fireman and guard of the runaway. The former explained that some steam had been coming from the pipe joint on the previous up journey and at Buxton a fitter was fetched and stopped the leak by a quarter turn on the nut. Shortly after they started with the down train steam began blowing again and, although rags were wrapped round the joint, matters got worse. The driver decided to stop in the loop at Bibbingtons Sidings and see if assistance could be obtained. A "terrific bang" was followed by scalding steam which drove them back, but they screwed down the tender brake and tried to close the regulator, finally accomplished partly with the aid of a fire iron. They wrapped coats, etc., round them in these endeavours but at the summit speed had not been reduced and the driver told him to jump off and apply some wagon brakes. He managed to drop some six or seven handles but could not pin them down, so ran back and shouted to the guard to apply his brake. This also appeared to have no effect.

The guard said he realised something was wrong when they failed to stop as usual and applied his brake; he saw steam pouring from the engine, but could do nothing more than remain at his post until the collision. All the week this same driver had stopped properly to pin down brakes.

The driver of the banking engine, which had assisted the train to the summit, noticed the guard struggling with his brake; he stopped and picked up the fireman who explained what had happened. In case the driver might have jumped off they searched the line to Dove Holes signalbox, where they learned the telephone line was dead and realised there must have been an accident.



Steam brake pipe joints on locomotive involved in the accident at Chapel-en-le-Frith South, February 9, 1957

The Engine

Engine No. 48188, stationed at Warrington, was built in 1942 and had run 392,100 miles since and 38,200 since the last heavy intermediate repair at Horwich in April, 1955, before which it had undergone a general repair at Crewe in January, 1953.

Steam comes to the driver's brake valve from a manifold through a combined

ejector steam valve casting, with certain stop valves; the final connection to the brake valve itself is through a 1¼ in. internal dia. copper pipe with coned joint at its upper end and butt joint at its lower, where it connects to the brake valve casting. (See accompanying drawings.)

The lower joint, which failed, is made by inserting an impregnated asbestos or Walkerite, packing between a collar brazed on the end of the pipe and the screwed end of the valve casting; the union nut is screwed up until the joint is steam tight. The upper joint is made by brazing to the pipe a turned brass cone fitting into a corresponding mouth; it also is tightened by a union nut. Leaks occur from time to time, due primarily to vibration loosening slightly the nuts, and usually are stopped by tightening, although sometimes the butt joint packing requires renewal. Very occasionally a blow occurs through a defect in the brazing, detected easily in the coned joints where such are exposed. The nut, however, covers the end of the collar in a butt joint, and such a defect can be detected only by removing it. Normally this is not done unless tightening fails to stop a leak.

The engine was found with reversing gear at full forward, regulator lever shut and tender hand brake fully applied. The pipe to the brake valve had broken away with a gap of 2 in. between it and the fitting. The collar had broken away from the pipe and was jammed in the union nut. The joint was sent for metallurgical examination and from this it was concluded that:— (*a*) the nut had been appreciably distorted at the end where the pipe emerged; (*b*) the collar had been machined from a very porous casting, and would easily distort under pressure; (*c*) the collar was not solidly brazed to the pipe and the joint—such as it was at failure—was not a good one; some of the brazing metal had overflowed to the collar face, thicker on one side than the other; (*d*) pressure produced when tightening to get a steam tight joint had distorted the collar and recessed the face of the nut, the top of which was distorted sufficiently to cause a small crack in the internal angle (see drawing); (*e*) the collar had jammed against the inside of the nut and some of the packing had become embedded in the second and third screw threads; (*f*) the copper pipe and brazed collar had been annealed at least once during their period of service and initial straining of collar and brazing metal had occurred some time before the last annealing; (*g*) the joint failed through disintegration of the brazing under stress and the collar began to turn during the tightening of the nut until it became so loose that the pipe end blew out.

History of the Valve

As far as could be ascertained the steam brake pipe had not been removed since the last heavy intermediate repair at Horwich in 1955. It is regular practice there to examine, repair and anneal such pipes, removed when footplate fittings are taken down for repair, and it can be concluded that this pipe was last annealed on that occasion. It is impossible to say whether it was on this engine before that. Annealed pipes are not always replaced on the engines from which they are removed and no record is kept. Some of the Warrington repair cards relating to this engine had been lost, but from November 12, 1955, to February 9, 1957, inclusive, this pipe had been reported as blowing on 10 occasions, repairs taking 15 min. for seven of them and 30 for the remainder, with one case of no time recorded. There is no record of annealing or detailed examination during this period and most fitters concerned could not recollect what action they took; probably blowing was stopped by tightening the nut. From a study of some reports relating to other engines it was concluded that in their case a similar class of defect occurred once per engine every 5·2 months, compared with 1·8 for engine No. 48188, excluding one case where the defect was noticed by a fitter at an "X" day examination on September 1, 1956.

Evidence of Fitters

The fitter at Buxton, called to the engine on the morning of the accident, said he stopped the little steam that was appearing by a quarter turn on the nut. That usually cured such trouble, but if not he would unscrew the nut and change the Walkerite joint. Very occasionally he found a leak through the brazing, but this was usually with the smaller injector pipes.

He would have renewed this joint had he realised it had been leaking on the previous day, but the driver said it had only just started.

The leading fitter, with 32 years' experience, confirmed this; very occasionally a collar needed re-brazing, usually on the small pipes. He had never known one twisted off as in this case.

Steam Pipe Joint Leaks

A fitter's mate at Warrington had stopped a leak in like manner the day before, on this engine, and another fitter, at Stockport, with 42 years' experience, attended to one on November 23, 1956, and dealt with it similarly. When tightening the nut did not do that, the Walkerite joint usually required renewing. It was very rare to find leaks through the brazing between collar and pipe and he had never heard of a large collar coming off. Sometimes brazing round the collars of small pipes became broken away when nuts were screwed up too much.

Inspecting Officer's Conclusions and Remarks

This accident was initiated by the very unusual failure of the steam pipe joint, the scalding leak from which drove the enginemen back from the controls. They could not reach the whistle but operated the tender hand brake and only with great difficulty closed the regulator partially. Speed at Dove Holes station is estimated at 25 m.p.h. and probably reached 55 by the moment of collision; it would have reached to nearly 80 further on had there been a clear run, though the train might easily have become derailed at one of the many sharp curves. Had it not it probably would have stopped about ¼ mile short of the second long falling gradient. No one on its engine—or on the banking engine—was in any way to blame. The driver could have saved his life by abandoning it but remained to give warning to the Dove Holes signalman and no doubt in the hope of regaining control. He set an outstanding example of devotion to duty, recognised by the posthumous award of the George Cross. The guard could do no more than he did and the fireman made a plucky effort to carry out his driver's instructions and pin down brakes. The Bibbingtons Sidings signalman clearly was alert and the one at Dove Holes was in a very difficult position, and is not criticised for allowing the train to run to the main line although the section ahead was not clear. There was the possibility of the driver regaining control before overtaking it and, on the other hand, the certainty of a serious derailment at the end of the loop. All those at Chapel-en-le-Frith acted with commendable promptness.

The Buxton fitter did not know that the joint had been blowing the previous day; neither he nor the other fitters are blamed for carrying out the repairs by merely tightening the nut in the normal

Some of the wreckage after the accident at Chapel-en-le-Frith, British Railways London Midland Region, on February 9, 1957

way. It is not practicable to examine all engine repair cards before each "X" day examination and the fitter who noticed the leaky joint on September 1 did not realise the pipe had been blowing on two other recent occasions.

Brigadier Langley does not criticise the standard procedure, but points out that with the butt joints the brazed collar is concealed by the nut; defects cannot be seen without removing the latter, usually done if the normal method of stopping a leak fails. One may therefore develop without being noticed immediately. This collar was badly brazed, in that it was not solidly done over the whole distance from the ring of brazing to the end of the pipe, while, owing to the small space between collar and pipe, some brazing overflowed, making the collar's inside face thicker on one side than the other, resulting in uneven pressure on the packing so that the joint would not be steam tight until the nut had been tightened very hard.

Initial distortion must have started a long time ago, as it began before the pipe was last annealed. It is significant that this joint blew much more frequently than others on engines of the same class; the brazing gradually disintegrated as the nut was tightened more and more until the collar was free to turn and became so loose that the end blew out. Reports were not sufficiently numerous or unusual to attract attention and the deterioration remained unnoticed.

Practical action has been taken in the Region and these butt joints will be converted to the coned pattern, giving better surfaces, while leaks through the brazing can be detected without removing the nut. Brazing also has been improved by chamfering the collar to ensure full penetration of metal without relying on an excessively large fillet.

It is anticipated that the conversion will be completed within the next three to four years, but all butt joints on such valves are to be taken down at the first "X" day examination and subsequently at every 40 to 48 thousand miles, to ensure detection of any fault in brazing or collar. Orders have been issued that if steam leakage is observed the pipe is to be removed forthwith, joint and brazing thoroughly examined and repaired where necessary. Brigadier Langley recommends that similar action be taken, where necessary, in other Regions.

Had the train had the vacuum brake one of the enginemen, in spite of the difficult conditions on the footplate, might have been able to throw over the combination brake handle before the train got out of control and, had he failed, the guard, on realising the situation, could have applied the brake; retarding power would have been sufficient to reduce speed and eventually stop the train, even on the sharp gradient. It is satisfactory to note that the British Transport Commission has announced that it is to equip all freight rolling stock and during 1957-1958 200,000 more new or rebuilt vehicles will be fitted.

NEW CANTEEN OPENED AT EARLESTOWN WORKS.—The new canteen built by the London Midland Region for the 1,900 staff at Earlestown Carriage & Wagon Works was opened last week. It is the result of the conversion and extension of a former mess-room. A new kitchen and servery have been added and a new heating system installed. The work was carried out by the resident engineer, Manchester.

Parliamentary Notes

B.T.C. Purchasing Procedure

Mr. Philip Goodhart (Beckenham—C.), on the adjournment of the House of Commons at 12.59 a.m. on December 5, raised the issue of the purchasing procedure of the B.T.C. He explained that he did this for three reasons. He did not believe that justice had been fully done to his constituent, Mr. Gethin, whose charges were the basis of the investigation which was made by Sir Harold Howitt; he did not believe it was possible to over-emphasise the cautionary tales which could be drawn from the report of the investigation; and although he believed that much good had already come from the report, there was still more to be done.

After his departure from the Commission, Mr. Gethin cited a number of important cases in which he thought the Commission had purchased unwisely. As the Commission was engaged in a modernisation programme, involving the expenditure of some £1,200 million, this was obviously a matter of national importance. Sir Harold Howitt investigated those charges, and they should be grateful to him for, in his own words, "setting out the relevant facts in some detail so that they may speak for themselves." The narrative he had written had been of great value, even if at times he had seemed to make two and two equal five, which was a very odd action for a distinguished accountant. Many informed commentators believed that Sir Harold had been less than fair with Mr. Gethin; that, in fact, the narrative supported Mr. Gethin rather more than Sir Harold would allow.

Mr. Gethin made four minor allegations, Mr. Goodhart continued, if one could call them that. Sir Harold had some rather sharp comments to make about many of them, noticeably the replacement of the ss. *Dinard*, which was originally supposed to have cost just over £1 million and, in the end, cost more than £1½ million. Sir Harold had made certain strictures, even though they were not always clearly expressed. Mr. Gethin made three main charges, about signalling, about overhead electrification, and about the provision of vacuum brake cylinders. Sir Harold has found, certainly in the first of these two cases, that no money was wasted.

The efficiency of the financial safeguards imposed by the B.T.C. could be checked, because there was the case of the vacuum brake cylinders. On April 23 the Commission Supply Committee agreed that the Westinghouse Brake & Signal Co. Ltd. should supply 500,000 of these cylinders, and the price was to be just over £30 each. There then followed a period of controversy, and the British Motor Corporation was brought into the field. The Corporation offered to supply cylinders at £21 14s. 8d. each. Westinghouse then lowered its price to £23.

The B.T.C. Financial Department had agreed that £30 was a fair price for these vacuum brake cylinders, and when the British Motor Corporation bid came in the Commission had decided to ask the Corporation to find out whether it really was possible to produce these cylinders at the price offered. This was the only case in which it was possible to check whether the Commission safeguards had proved to be efficient.

The new B.T.C. purchasing directive was an improvement on the old one, but everything depended on the spirit in which it was implemented. It was common knowledge that in many big industrial firms there was a clash between the engineering men on the technical side and the contract or purchasing side. He believed that this was what happened in the B.T.C. In a normal profit-making firm, the contracts officer could count on the co-operation of the board of directors, because they would be interested in saving all the money they could. In a nationalised industry, the members of the board would be interested in not wasting money, but they were not so immediately, personally involved as people in a private firm. Therefore, in a nationalised industry, it was particularly important that the contracts officer should have all the help he could get.

He would like to see the establishment of a small board of outside auditors who would, at irregular intervals, descend on the various nationalised industries to check the procedure and practice of contracting. Perhaps even one man could do the job. The establishment of one external watchdog would have one further benefit. At the moment, manufacturers who dealt with a nationalised industry were inhibited from complaining when they thought they had been unfairly treated. They were frightened of making a fuss, because they thought they would lose what business they had. The appointment of one small poodle of a watchdog would give them an additional means of access and an additional avenue of complaint.

It had often been said that the B.T.C. departed from competitive tendering only with the greatest reluctance, but in 1956, when £120 million was spent, only 41 per cent of this amount went out to competitive tendering. That was clearly not good enough.

Mr. G. R. H. Nugent, Joint Parliamentary Secretary to the Ministry of Transport & Civil Aviation, replying, said that, as to the idea that there should be some sort of watchdog, the Minister was responsible to Parliament for the broad policy and action of the B.T.C. Once a year the Commission presented its annual Report, which was debated and could be studied in detail in the House of Commons. In addition to that there was the Select Committee on the Nationalised Industries. These were very substantial safeguards and, in his opinion, were quite adequate.

There was very little, if any, independent evidence to support the allegation that Sir Harold Howitt was less than unfair to Mr. Gethin in his report. Indeed, the general impression his report had made was an impression of impartiality and thoroughness. He understood that Sir Harold Howitt turned on to the job of that investigation about 14 of his own staff, and that they were working for eight weeks on that exclusively; that during that period, as well as studying a great many papers, they interviewed 40 responsible officials apart from the many personal contacts they had. The Member for Beckenham was taking upon himself a very big responsibility in conflicting with the views reached by Sir Harold Howitt, quite obviously generally accepted throughout the country.

The report showed that during Mr. Gethin's two years' service, he did make a useful contribution to the development of the right solution to this complex problem. He was a senior official highly paid to do just this. He did it, and, indeed, it would have been very surprising if he had not, and Sir Harold Howitt in his report gave him full credit for this.

The question of the relationship between purchasing engineers and staffs was a common problem in industry as well as on the railways, and was a particularly difficult one. The history in the Com-

mission was that in 1955, before Mr. Gethin arrived, the Commission had started reviewing purchasing procedures and the appointment of Mr. Gethin was one way in which it was hoped to deal with the problem. . . . After much deliberation, the Commission finally decided to produce a new supplies organisation in May, 1957, resulting, in August, 1957, in the directive which provided for the appointment of a chief contracts officer, laying down the relationship with technical departments and his duties. Mr. Gethin broadly agreed with this. This contracts officer was appointed two months ago, and was making good progress. He is establishing good relationships and a uniformity of contractual practice. . . .

New Appointments

There would always be some occasions when it was in the interest of the railways for contracts to be placed without competition. It was the exception, but it inevitably arose sometimes—in particular, with the modernisation of the railways, when time has been such an important factor, and still is. The balance of advantage then had justified the placing of contracts by allocation and not by competitive tendering. The decision as to whether or not that should be done must lie with the Commission. These matters were essentially within the scope of the day-to-day management of the Commission. Therefore, he must reject the suggestion that a new control should be created. A progress officer was in the course of being appointed. A production officer would be appointed in a few months. They would have direct access to the Commission and to the Chairman himself.

In conclusion, Mr. Nugent said: "We must be clear that Mr. Gethin left the B.T.C. by agreement. Mr. Gethin had never made any complaint about that in public, or in any other way. He left on an agreed basis, and said so publicly in an agreed statement with the Commission. It was not until after he had left that he made his allegations about the Commission. . . . That the Commission "sacked" him because of some clash is completely without foundation.

Staff and Labour Matters

Railway Wage Claims

A meeting took place on December 12 of the Railway Staff Joint Council, comprising representatives of the B.T.C. and of the N.U.R., A.S.L.E.F., and T.S.S.A., at which the B.T.C. representatives explained their reasons for rejecting the claims from the three railway trade unions for improved rates of pay and a reduced standard working week for railway salaried and conciliation staff.

The union representatives stated they would refer the B.T.C. reply to their executive committees.

CURTHWAITE GOODS & PARCELS DEPOT TO CLOSE.—The London Midland Region announces that the goods and parcels depot at Curthwaite, between Carlisle and Wigton, will be closed from January 6. Alternative arrangements will be made for parcels, and passenger train merchandise also goods merchandise and minerals traffic at Wigton. Livestock will be handled at Wigton or Dalston according to traders preference and coal class traffic as consigned.

St. Johns Accident

Interim statement by Chief Inspecting Officer of Railways

In view of the very serious consequences of the collision at St. Johns, Southern Region, on December 4, and the widespread interest and anxiety expressed in connection with it, the Chief Inspecting Officer of Railways, Lt.-Colonel G. R. S. Wilson, who is conducting the inquiry on behalf of the Minister of Transport & Civil Aviation, held at Paddington Hotel on December 12 and 13 and now adjourned, has thought fit—as he did after the double collision at Harrow on October 8, 1952—to make an interim statement.

After hearing a number of witnesses, including some members of the public, on the density of the fog, probable speed of the colliding train, positions and operation of the signals, movements of certain trains prior to the accident and relevant matters, he came with regret to the conclusion that he ought to take that of the steam train driver and fireman in private "because they must not be prejudiced in the event of any subsequent legal proceedings being taken." The whole intention of such inquiries was, he stressed, that as much evidence as possible should be taken in public, but there had to be certain exceptions. He went on to say that on account of the concern felt generally "it would not be fair to the Press, public or Parliament" not to let those present at the inquiry know what he thought about the case, and continued:—"It is quite clear in my mind, and probably many of you have come to the same conclusion from what you have heard, that the Ramsgate steam train went by a signal at red—the signal which was protecting the mid-Kent electric train which was at a standstill. That train was held up by traffic in front of it, which was also held up very largely owing to the conditions of the fog.

"When a signal is passed at danger it always and invariably brings to the public mind the subject of what is called, and I think sometimes miscalled, automatic train control."

Warning Type A.T.C.

"Whether or not automatic train control of the warning type—as has been fitted for a long time in one form in the Western Region and is now being extended on British Railways in another and more modern form—would have prevented this accident I cannot be certain until I have heard the evidence of the enginemen.

"Warning control can only prevent accidents which arise from a certain class of driver's mistake. Nevertheless, there is still a possibility, of which even I cannot yet be certain, that automatic warning control might have prevented this accident, I cannot put it higher than that. I might have to say it would not."

Colonel Wilson then referred to letters to the Press and remarks made in Parliament regarding automatic train control and observed:

"Whether or not automatic train control of warning type is a suitable piece of equipment to install on a line of this character, very closely signalled with colour-light signals, there is no real certainty.

"Nevertheless, it is most understandable that there has been this public concern. On that point, I and the Minister of Transport have been assured by the British Transport Commission that the Commission will do all it can to accelerate the extension of automatic train control of the British Railways system to all the main lines of the country—not because automatic train control would necessarily have prevented the accident on this section of the line, but in view of the grievous nature of the accident.

"It is now free to do so because the long-standing experiments with automatic train control carried out on the east coast main lines have now been brought to a successful conclusion and the Minister's approval has been given. The British Transport Commission is doing all it can to accelerate provision of automatic train control together with other signalling safety measures.

Other Safety Measures

"That is very important because there are all sorts of other measures which are effective in preventing accidents from other causes. For example, complete track-circuiting, in force on this particular line, goes 99 per cent towards preventing the possibility of accidents being caused by signalmen's mistakes.

"Further, since 1929 the whole of the lines from Charing Cross, Cannon Street, London Bridge, New Cross, and St. Johns have been equipped with colour light signals and although this accident occurred in this very well equipped colour light signal area, there is no doubt that the need for automatic train control is less insistent in an area where there are colour light signals. This particular line would naturally rank quite low in priority for A.T.C."

Thorough tests failed to find the least defect in the signalling equipment.

B.P. 41 MILLION STOCK ISSUE.—Application lists for the £41 million convertible debenture offer by the British Petroleum Co. Ltd., described in our issue of December 13, were open on December 11 for a nominal five minutes only. Applications to a total of £675 million were received, so that the offer was more than 15 times oversubscribed. The basis of allotments is such as to allot about half the stock available to B.P. and Burmah Oil Company ordinary stockholders and to employees. The other half is being divided between other applicants, with preferential treatment being given to B.P. debenture and preference stockholders.

RESEARCH ON CEMENTED OXIDE TOOLS BY WICKMAN LIMITED.—It has been announced by Wickman Limited that a programme of tests on the application of cemented oxide tools was to be undertaken. The company has installed a machine tool unit for this purpose, at its Upper York Street, Coventry, works. The unit comprises three machines: a Max Muller Electromatic lathe of special design, a Heller FH.160 milling machine, and a Carlstedt deep hole boring machine. The department is also provided with a toolmaking section so that test tools can be quickly manufactured and modified for these machines, and also to provide tooling for the Wickman multi-spindle automatics shortly to be installed in the department for further research into the application of tungsten carbide tooling to automatic lathes.

Contracts and Tenders

Canadian National Railways order for wheels

Canadian National Railways has placed an order valued at some £556,000 for rolled steel wheels with three British firms. The manufacturers, and their share of the contract, are Steel, Peech & Tozer Limited, £174,000; John Baker & Bessemer Limited, £126,750; and Taylor Bros. & Co. Ltd., £257,250. This contract has been placed as a result of the Canadian Trade Mission to Britain, which included amongst its 57 members Mr. E. A. Bromley, Vice President, Canadian National Railways.

The British Transport Commission has announced that 42 sets of engine transmission and control equipments for 0-6-0 diesel-mechanical shunting locomotives of 200 h.p. have been ordered from the Drewry Car Co. Ltd. as part of the British Railways modernisation plan. The completed locomotives will be allocated betweeen the North Eastern and Southern Regions.

Associated Commercial Vehicles Sales, Limited, has received an order from the Department of Government Transport, New South Wales, for 112 "Regal" mark IV chassis fitted with Automonocontrol transmission. This is one of the largest orders received from an overseas operator for chassis incorporating this form of fully automatic transmission, and is worth some £300,000.

British Railways, London Midland Region, have placed the following contracts:—

Brooks Ventilation Units, Limited, London, W.C.2: installation of inlet plant, iron foundry, locomotive works, Crewe

John Booth & Sons (Bolton), Limited, Bolton: steelwork strengthening and extension to crane gantry on the Londonderry shed, Heysham Harbour

North Western Gas Board, Mid-Cheshire Group, Crewe: iron foundry heating, locomotive works, Crewe

Kind & Co. Ltd., Leytonstone, London, E.11: improvements to passenger station, Hatch End

E. B. Jones & Rawlinson, Limited, Salford, 6, Lancs: new station buildings, Burnage and East Didsbury Stations.

British Railways, North Eastern Region, have placed the following contracts:—

Dow-Mac (Products) Limited, Stamford: supply of pre-stressed concrete cable duct units

R. Blackett & Son Ltd., Darlington: flooring for rail welding depot, Dinsdale.

The Special Register Information Service, Export Services Branch, Board of Trade, has received a call for a tender as follows:—

From Australia:

30,000 non-metallic brake blocks suitable for use on the Corporation's seven-car electric "Harris" suburban trains. The brakes when applied at full force should be capable of stopping a fully loaded train weighing 360 tons travelling at 50 m.p.h. in a distance of not more than 1,250 ft. on straight and level track, with normal service conditions of wheels and rails.

The issuing authority and address to which bids should be sent is the Secretary for Victorian Railways, Railways Administrative Offices, Melbourne, C.1, Victoria. The tender No. is 61,266. The closing date is January 8, 1958. The Board of Trade reference is ESB/29650/57.

Further details regarding the above tender, together with photo-copies of tender documents, can be obtained from the Branch (Lacon House, Theobalds Road, W.C.1).

The Special Register Information Service, Export Services Branch, Board of Trade, has reported that the closing date for tenders for one power-operated signal-box and intercommunication systems for India, reported on page 636 of our November 29 issue, has been postponed to January 20, 1958.

Notes and News

Hoffman Manufacturing Co. Ltd., New Stockroom Opened.—The Hoffman Manufacturing Co. Ltd. has opened a new stockroom at 127, Bath Road, Slough, where an extensive range of Hoffman ball and roller bearings is carried.

Rubber Improvement Limited Purchase.—A recent announcement by Mr. John Lewis, the Chairman & Managing Director of Rubber Improvement Limited, stated that the offer of that company to purchase the issued ordinary shares of Hay & Robertson Limited has been accepted by holders of more than 90 per cent of such shares and accordingly the offer is now unconditional in this respect.

New Staff Building for Heysham North Quay.—Work has started on an amenities building for London Midland Region porterage staff at North Quay, Heysham Harbour. This building will include a foreman's office, messroom and kitchen, drying and locker rooms and a store. It has been designed for peak use of up to 40 staff. The structure will be 81 ft. long and 31 ft. wide, build in brick and reinforced concrete. Brown & Jackson, Limited, of Fleetwood, are the contractors.

Scottish Region Best Kept Station Competition.—In the annual competition for cleanliness and tidiness at stations in the Scottish Region the winners of Special Class awards of £6 each for 1957 were Dullatur, Dunragit, Lundin Links, Nairn, North Berwick, Stirling, Stonehaven, and Wemyss Bay. This is the sixth successive year in which Stirling has won a Special Class prize. First class awards of £5 each have been made to 48 stations, second class (£4) to 76, and third class awards (£3) to 176 stations.

London Midland Region (London) Orchestral Society Concert.—The London Midland Region (London) Orchestral Society, now in its 35th season, gave a concert at St. Pancras Town Hall on December 12. The orchestra, led as usual by George Elmitt and conducted by John Grindley, gave a light programme which was obviously appreciated by the audience. The playing was well up to the orchestra's usual high standard. The most important items in the programme were Massenet's ballet music from "Le Cid" and Haydn's "Toy" symphony; the latter was impeccably played as to the string parts, and with the appropriate mixture of accuracy and amusement by the soloists on the toy instruments. Xylophone solos were played by Alan Scott and contralto solos were sung by Anne Ashton Channen, a young singer of whom much more will surely be heard. As with so many amateur orchestras, some augmentation from other sources is necessary before a concert can be presented, and more players are wanted urgently.

New Staff and Stores Building for Colne Carriage Depot.—Work is to start shortly on a scheme to provide the Colne Carriage Depot with new stores, offices, workshops, and staff amenities; they will be housed in a two-storey brick building which will replace the present temporary structures.

Cross-Channel Air Ferry Rates Reduced.—Lower cross-Channel air ferry charges for motor-cars in summer were announced on December 12 by Silver City Airways. They show average reductions of 25 per cent on the rates charged last summer, those for some popular cars will be reduced by 48 per cent. The reductions apply to routes from Ferryfield to Le Touquet, Calais, and Ostend, and also from Southampton to Cherbourg and Deauville.

New Staff Amenities at Wath Marshalling Yard.—Work has started on the construction of four buildings for the accommodation of staff at Wath Marshalling Yard. They are sited at Elsecar Junction, at Turntable Lobby and at each of the two humps in the yard. A fifth building is to be constructed at Moor Road in a few months' time. The buildings will be of different designs but all will be of brick construction with flat roofs. The largest of the four will be that at Elsecar Junction.

"Starlight Special" Trains in 1958.—British Railways "Starlight Special" excursions are again to run next year between London and Edinburgh and Glasgow. These express trains will offer cheap overnight travel between London and Edinburgh and between London and Glasgow, with a guaranteed seat, at a fare of 85s. for the round trip. They will begin on the night of April 3 from London, and on April 4 from Scotland, thereafter on every Friday night in each direction until September 19. Passengers may return by "Starlight Special" train on the Saturday week or Saturday fortnight after the date of departure. Light refreshments will be available on the trains. Advance bookings will be made from January 1, 1958, at the principal railway stations and railway ticket agencies in the London area; and in Glasgow and Edinburgh from January 3, except for Glasgow Fair week and Edinburgh Trades Holiday, for which bookings will open on January 10.

New Buildings at Cricklewood.—Work has started on two new buildings which will provide modern offices and amenities for the wagon sidings staff at Cricklewood Brent marshalling yards in the London Midland Region of British Railways. They will replace existing timber huts and should be completed by next September. A two-storey brick and reinforced concrete structure will be built at the empty wagon sidings. The ground floor, at sidings level, will house lavatories, drying rooms, and stores for the Carriage & Wagon, Signal Engineer's and Traffic Department staff.

On the first floor there will be messroom and office accommodation for Carriage & Wagon and operating staff. The new building at the loaded wagon sidings will be a single-storey structure in brick and reinforced concrete. It will include office, stores, lavatory, messroom and drying room accommodation for the Carriage & Wagon and operating staff. Brent marshalling yards, six miles north of St. Pancras, extend on both sides of the main line. More than 300 trains a day are marshalled there.

South African Sympathy over Accident at St. Johns.—The South African Minister of Transport, Mr. Ben Schoeman, has sent a message of sympathy to the British Transport Commission over the St. Johns railway accident on December 4. The Chairman of the Commission, Sir Brian Robertson, has replied, expressing appreciation of the message.

Henschel Debt Settlement.—Some 85 per cent of the 2,880 creditors of the Henschel Works, Kassel, have agreed to a settlement proposed by the company. Amounts up to DM.5,000 will be paid within a month. Larger debts will be paid in 10 per cent instalments each quarter. A law court must still examine the creditors' voting before the settlement is complete.

Presentation of Original of N.E. Region Poster.—The original painting by Mr. E. H. Spencer of British Railways, North Eastern Region, poster "The History of York" was presented to the Lord Mayor of York, Alderman E. L. Keld, by Mr. H. A. Short, General Manager, North Eastern Region, in the Mansion House, York, on November 21. The painting is to be hung in the city's information bureau. An illustration of the poster appeared on page 466 of our issue of April 19, 1957.

London Airport Link.—In a speech at the annual dinner of the British Independent Air Transport Association in London recently, Mr. Harold Watkinson, Minister of Transport & Civil Aviation, stated that he was tackling the problem of journey-time between city centres and airports within the scope of the new road and rail programmes. He thought there would be a "notable improvement in the next year or so." New roads, railways, and perhaps a monorail would all play their part. After Gatwick Airport was ready next Spring, a third London airport might be required later.

Motorist Fined for Obstructing Train.—A motorist was fined £5 recently at East Riding Quarter Sessions after pleading guilty to obstructing an engine on the line at Seadale level crossing, near Filey. It was stated in court that the driver of a Scarborough - Hull diesel train saw a motorcar on the track as he approached the level crossing. He sounded the hooter and braked, but hit the motorcar before he could stop. The motorist stated that he had told his son to get out of the vehicle and open the gates. When he saw the train coming he and his passengers got out of the motorcar and it was empty when struck by the train.

Sightseeing Cruises by British Railways "Duke" Ships.—Cruises along the Dutch, Belgian, and French coasts with sightseeing tours of Continental cities are to be operated by one of the British Railways, London Midland Region, *Duke* ships normally on the Heysham-Belfast route. The ship will sail from Southampton on June 7, 14, and 21 for six-day cruises with all-in-fares ranging from £24. The 5,000-ton *Duke* offers as high a degree of comfort and accommodation as any of the British Railways cross-Channel fleet; it is being fitted with additional amenities, including more baths and showers. Some 300 passengers will be accommodated on these cruises. The normal complement on the Heysham-Belfast run is 1,800.

Formation of Airtech Limited Engineering Division.—Airtech Limited, which, besides offering a consultant design service for complete hydraulic and pneumatic systems, is manufacturing a range of components for industry, has formed an engineering division. Mr. P. J. Langdon has been appointed Sales Manager.

Railway Exhibition on Southend Pier.—Throughout the winter the Eastern Region of British Railways is staging a railway exhibition in the New Hall at the far end of Southend Pier. The theme of the exhibition is modernisation. A variety of photographs, transparencies, and models has been used to show all phases. They include models of stations and other installations now undergoing reconstruction. The exhibition is open to the public free of charge.

Silverton Transport & General Industries Limited.—The profit earned from tramway operations by the Silverton Tramway Co. Ltd. in the year ended June 30, 1957, was £193,748. Income from investments was £16,414, and excess depreciation written back amounted to £621, so that after sundry expenses total profits were £208,223. Taxation takes £85,000. Dividends take £80,000, £44,126 is transferred to general reserve, leaving an amount to be carried forward of £10,937. A final dividend of 6d. a share was declared.

United Railways of the Havana & Regla Warehouses Limited.—The joint liquidators of the United Railways of the Havana & Regla Warehouses Limited announce that judgment has been given in the action by the Trustee of the 7½ per cent Equipment Trust Certificates. The Court upheld the claim of the Trustee and awarded costs of the action. Subject to appeal, the liquidators will call on the Republic of Cuba to reimburse any amount payable to the Trustee. Leave to make a further distribution will be sought in due course.

Messages of Sympathy over St. Johns Accident.—Among numerous messages of sympathy received by the British Transport Commission in connection with the railway accident at St. Johns have been cables or telegrams from M. Louis Armand, President, French National Railways; Dr. F. Q. den Hollander, President, Netherlands Railways; Signor Severo Rissone, Director General, Italian State Railways; Mr. T. C. Courtney, Chairman, Coras Iompair Eireann; Mr. B. J. Schoeman, Minister of Transport, South Africa; Mr. D. H. C. du Plessis, General Manager, South African Railways; Mr. Donald Gordon, Chairman & President, Canadian National Railways; Mr. G. W. Brown, Acting General Manager, New Zealand Government Railways; Mr. A. E. Perlman, President, New York Central System.

British Railways Christmas Arrangements.—Passenger train services will operate on British Railways in England and Wales during the Christmas holidays as follows. On December 24, there will be an augmented weekday service. On December 25, Christmas Day, a Sunday service, adjusted as necessary, will operate in the Eastern, London Midland, North Eastern, and Western Regions. In the Southern Region there will be a special service as advertised. On December 26, Boxing Day, the London Midland and North Eastern Regions will provide a modified weekday service. In the Eastern Region there will be a modified weekday service, except on the L.T.S. Line, where a modified Sunday service will be operated. In the Western Region a modified Sunday service will be in force. The Southern Region will run a main-line Sunday service, adjusted as necessary, and a special suburban service as advertised. In Scotland, there will be normal services throughout the Christmas period, but additional trains will be run to and from England.

Marchington Goods Depot to Close.—The London Midland Region of British Railways announces that the goods depot at Marchington Station, between Uttoxeter and Tutbury, is to be closed on and from January 6, 1958. Alternative arrangements will be made for merchandise, minerals, and coal class traffic.

Forthcoming Meetings

January 1 (*Wed.*).—Electric Railway Society, at the Fred Tallant Hall, 153, Drummond Street, London, N.W.1., at 7.15 p.m. Paper on "Metropolitan Railway electric rolling stock," by Mr. V. Goldberg.

January 3 (*Fri.*).—The Railway Club, at 320, High Holborn, London, W.C.1, at 7 p.m. Paper on "Some thoughts on timetables," by Mr. E. J. T. G. Bagshawe.

January 3 (*Fri.*).—British Railways (Southern Region) Lecture and Debating Society. New Year social evening at the Waterloo Dining Club.

January 6 (*Mon.*)—Historical Model Railway Society, at the Railway Tavern, Liverpool Street, London, E.C.2, at 7 p.m. Talk on the building of a model "Dean" single locomotive by Mr. D. G. Webster.

January 6 (*Mon.*).—Railway Correspondence & Travel Society, Northampton Branch, at the Liberal Club, Castillian Street, Northampton, at 7.30 p.m. Paper on "The last drop of steam in Ireland," illustrated by lantern slides, by Mr. D. R. Smith.

January 6 (*Mon.*).—Institute of Transport, Darlington Group, at United House, Grange Road, Darlington, at 7 p.m. Paper on "Transport in Nigeria," by Mr. E. Dalton.

January 7 (*Tue.*).—Permanent Way Institution, Leeds & Bradford Section, in the British Railways Social & Recreation Club, Ellis Court, Leeds City North Station, at 7 p.m. Sound and colour films entitled "Colour under Control," presented by Ingham Clark & Company, of Wortley, Leeds 12. Also "Steel Road," film loaned by The United Steel Companies, Limited, Sheffield.

January 7 (*Tue.*).—South Wales & Monmouthshire & Docks Lecture & Debating Society, at the Angel Hotel, Westgate Street, Cardiff, at 6.30 p.m. Paper on "B.R.S., first decade: what next?" by Mr. J. Freeguard, Divisional Manager, Western Division, British Road Services.

January 7 (*Tue.*).—Institute of Transport,

Midland Section, at the Exchange and Engineering Centre, Birmingham, at 6.30 p.m. Paper on "European transport," by Mr. C. F. Klapper.

January 8 (*Wed.*).—Permanent Way Institution, London Section, at the Headquarters of the British Transport Commission, 222, Marylebone Road, N.W.1, at 6.30 p.m. Paper on "Heavy plant," illustrated by lantern slides, by Mr. E. C. Cookson.

January 8 (*Wed.*).—British Railways Southern Region) Lecture & Debating Society, at the Chapter House, St. Thomas' Street, London, S.E.1, at 6 p.m. Paper: "At home with the Shipping Department," by Mr. R. E. Sinfield, Continental & Shipping Manager, Southern Region.

January 8 (*Wed.*).—Institution of Railway Signal Engineers, York Section, at the Signalling School, Loft Green, York, at 5.30 p.m. Paper on "The work and problems of a district linesman," by Mr. R. F. Dean.

January 8 (*Wed.*).—Institute of Transport, Southern Section, at the Harbour Board Offices, Southampton, at 5 for 5.45 p.m. Paper on "The oil industry in relation to transport," by Mr. A. G. Taylor, manager, Inland Distribution Centre, Esso Petroleum Co. Ltd.

January 9 (*Thu.*).—British Railways (Western Region) London Lecture & Debating Society, at the Headquarters Staff Dining Club, Bishop's Bridge Road, Paddington, W.2, at 5.45 p.m. Railway quiz-questions on railway operation and administration. Questionmaster, Mr. H. G. Bowles, Assistant General Manager (Administration), Western Region.

January 10 (*Fri.*).—Institute of Transport Northern Section, at the Royal Station Hotel, Newcastle-upon-Tyne, at 7 p.m. Paper on "Transport in modern times," by Major-General G. N. Russell.

January 13 (*Mon.*).—Institute of Transport, at the Jarvis Hall (R.I.B.A.), 66, Portland Place, London, W.1, at 5.45 p.m. Paper on "Railway freight traffic operation in the light of railway modernisation," by Mr. C. P. Hopkins.

OFFICIAL NOTICES

THE NIGERIAN RAILWAY CORPORATION invites applications for the following post: ASSISTANT WORKS MANAGER (Carriage and Wagon). *Duties:* The Assistant Works Manager will be responsible to the Carriage and Wagon Superintendent for the supervision of staff of the Carriage and Wagon Shops and of a number of Outdoor Depots. *Qualifications:* The candidate must have had a good general education followed by a sound technical training. He should have served a regular apprenticeship on a British Railway or in a Carriage and Wagon workshop of a rolling stock manufacturer with subsequent experience on a Railway. He must be capable of dealing with all classes of repairs to rolling stock in Workshops and in maintaining all types of rolling stock in service. He should be capable of taking independent charge of a workshop, for which purpose he will be required to have experience of administrative work, both for workshops and Outdoor Depots. He should have had Drawing Office experience and must have passed Parts I and II of the Institution of Mechanical Engineers examination. It is desirable also that the candidate should have had some experience of workshop organisation including Progress and Production methods. *Salary:* In scale £800 × £50 per annum to £1,600 per annum plus £300 per annum Overseas Pay. Starting salary according to qualifications and experience. Appointments on contract with 20 per cent. gratuity per annum of total pay or on pensionable terms. *Tours:* 15 months in Nigeria followed by 15 weeks' leave on full pay. *Quarters:* Partly furnished quarters are provided at low rental. *Allowances:* There are attractive family, travelling, transport and other allowances.—Send postcard before 31st December, 1957, mentioning the post and this paper for further particulars and application form to: The London Representative, Nigerian Railway Corporation, Nigeria House, 9 Northumberland Avenue, London, W.C.2.

FOR SALE OR HIRE, Hudswell Clarke 0-6-0 standard gauge STEAM LOCOMOTIVE, in good condition.—Apply Eagre Construction Co. Ltd., Scunthorpe, Lincolnshire. 'Phone 4513 (7 lines).

SENIOR ASSISTANT TRAFFIC SUPERINTENDENTS required by Malayan Railway Administration, Federatiou of Malaya, for 1 tour of 3 years. Salary scale (including Expatriation Pay and present temporary allowances) equivalent to £1,218 rising to £2,119 a year (single men), £1,440 rising to £2,499 a year (married men), £1,531 rising to £2,730 a year (family men). Commencing salary according to qualifications and experience. Gratuity at rate £232/324 a year. Free passages. Liberal leave on full salary. Candidates must be Corporate Members of the Institute of Transport and have had considerable experience in the Operating and Commercial Departments of a railway.—Write to the Crown Agents, 4 Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M3/44151/RA.

IMPERIAL CHEMICAL INDUSTRIES LIMITED, Billingham Division. TRANSPORT OPERATING MANAGER. The Transport Section at Billingham, in Co. Durham, embraces the road, rail and wharf activities of the largest chemical factory in the country. There is a vacancy for an operating manager who must have had rail or road operating experience. Applicants should not be over 35 years of age and should be University graduates or hold an equivalent specialised qualification. All our employees join the Pension Fund and participate in the Profit Sharing Scheme and other conditions of employment are excellent. For married men there are schemes for assisting house purchase and the payment of removal expenses and a lodging allowance. Those interested should write, giving brief details of their experience and qualifications, to the Staff Manager, Imperial Chemical Industries Limited, Billingham Division, Billingham, Co. Durham, quoting Ref. No. B/Q/6.

THE NIGERIAN RAILWAY CORPORATION invites applications for the following post:—MOTIVE POWER OFFICER. *Duties:* A Motive Power Officer is responsible for the supervision of locomotive utilisation, failure, water and coal supplies, lubrication and the employment of enginemen. He is further responsible for Rest Houses, Staff and Discipline and the maintenance of breakdown train equipment. *Qualifications:* Candidates must have served an apprenticeship, graduateship or diploma course or pupilage with a Railway Company or locomotive manufacturers, with subsequent experience on a railway. Candidates should have had extensive experience in both utilisation and repair of locomotives and must have had 5 years' experience in motive power organisations in the locomotive running section of a railway with knowledge of machine and repair shop methods and be capable of controlling staff and labour. Experience in Diesel maintenance and utilisation an advantage. Candidates must possess A.M.I.Mech.E. or A.M.I.E.E. or be graduates thereof. *Salary:* In scale £800 × £50 per annum to £1,600 per annum plus £300 per annum Overseas Pay. Starting salary according to qualifications and experience. Appointments may be on contract with 20 per cent. gratuity per annum of total pay or on pensionable terms. *Tours:* 15 months in Nigeria followed by 15 weeks' leave on full pay. *Quarters:* Partly furnished quarters are provided at low rental. *Allowances:* There are attractive family, travelling, transport and other allowances.—Send postcard before 6th January, 1958, mentioning the post and this paper for further particulars and application form to: The London Representative, Nigerian Railway Corporation, Nigeria House, 9 Northumberland Avenue, London, W.C.2.

BOUND VOLUMES.—We can arrange for readers' copies to be bound in full cloth at a charge of 25s. per volume, post free. Send your copies to the SUBSCRIPTION DEPARTMENT, Tothill Press, Limited, 33 Tothill Street, London, S.W.1.

Railway Stock Market

Values in stock markets have strengthened under the lead of a rise in British funds, though the volume of business showed the decline usual at this period of the year. Sentiment was helped by the latest trade figures which show the smallest monthly trade gap for seven years. On the other hand, it is realised that a true picture of the trade position cannot be obtained from one month's figures but from the trend over a period. It is clear, however, that the 7 per cent Bank rate and the increased credit squeeze have achieved part of their object in strengthening the £, and this has not been due to the speculative flow of foreign funds to London attracted by high money rates, but to demand for sterling for commercial purposes. On the other hand, the sharp fall in steel production in the U.S.A. and the downward trend in steel output now in evidence in Britain are among many pointers which pose the question whether slowing down in world trade will cause concern in the first part of next year. World trade trends are of course influenced in the main by the tendency in the U.S.A. The heavy fall in copper and lead and in some commodities, too, are evidence that the wheels of trade are revolving less rapidly, and in the circumstances, a cautious attitude in stock markets is understandable. Company results generally are showing lower earnings although the majority of dividends are being maintained.

Foreign rails have reflected the uncertain trend in stock markets and in many cases were scarcely tested by dealings. There was, however, some further selling of Antofagasta ordinary stock, which showed a fresh decline to 17, while the preference stock also dropped sharply to 35.

United of Havana second income stock remained at 7¼, and San Paulo 3s. units kept at 2s. 1½d. but Mexican Central "A" bearer debentures held firm at 70. Chilean Northern 5 per cent debentures were 39 and Costa Rica ordinary stock 16½, while elsewhere, International of Central American shares were again quoted at $18 with the preferred ordinary stock $127. Brazil Railway bonds were again around 5½. Elsewhere, Nyasaland Railways shares held their recent improvement to 10s. 3d. Canadian Pacifics eased further to $45¾, their lowest point so far this year. The preference stock eased to £55 and the 4 per cent debentures to £63, while elsewhere, White Pass shares at $14 were at their lowest so far this year. Dollar stocks of course move very closely with the trend on Wall Street. Peru Transport shares remained at their par value of $1.

There was very little movement in shares of locomotive builders and engineers. Beyer Peacock 5s. shares kept around 8s. 3d., and Charles Roberts 5s. shares were 8s. 4½d., while Westinghouse Brake strengthened slightly to 31s. 9d., and Gloucester Wagon 10s. shares have remained at 14s. 3d. Wagon Repairs 5s. shares showed firmness at 13s. xd. and among other shares, G. D. Peters, which are held very firmly, had a quotation of 28s. 2d. There was a further easing of North British Locomotive to 13s. Hurst Nelson were 25s. and Birmingham Wagon rallied from 15s. 10½d. to 16s. 3d.

T. W. Ward remained a steady feature at 70s., British Aluminium have been a little firmer at 41s. 4½d. and British Oxygen were 32s. 9d. The 2s. 6d. shares of the Butterley Company at 16s. 3d. were well maintained on balance, but British Timken eased to 50s. 9d. Ransomes & Marles 5s. shares were 10s. and G. & J. Weir at 15s. lost part of an earlier rise. The 10s. shares of the Dowty Group were 32s., Pressed Steel 5s. shares 14s. 3d. though in other directions, Guest Keen eased to 46s. 6d. Despite the good results and the various dividend increases, steel shares showed little change as compared with a week ago. It is recognised that the past year's higher profits have come from increased production. Now there is evidence of falling off in demand and of some decline in production. Nevertheless, steel dividends are very modest in relation to earnings and results would have to undergo a very big fall before the current dividend rates were endangered. It is, of course the threat of re-nationalisation in the event of another Labour Government which explains why steel shares are valued on a high yield basis.